



Making Circularity Actionable

An Interaction Design Approach to Identifying Demands and Developing a Digital Circular Business Model Tool for Furniture SMEs

Master's thesis in Computer science and engineering

LINA BÖKMARK
AMANDA EKSTEDT

MASTER'S THESIS 2026

Making Circularity Actionable

An Interaction Design Approach to Identifying Demands
and Developing a Digital Circular Business Model Tool for
Furniture SMEs

LINA BÖKMARK

AMANDA EKSTEDT



UNIVERSITY OF
GOTHENBURG



CHALMERS
UNIVERSITY OF TECHNOLOGY

Department of Computer Science and Engineering
CHALMERS UNIVERSITY OF TECHNOLOGY
UNIVERSITY OF GOTHENBURG
Gothenburg, Sweden 2026

Making Circularity Actionable
An Interaction Design Approach to Identifying Demands
and Developing a Digital Circular Business Model Tool for
Furniture SMEs
LINA BÖKMARK
AMANDA EKSTEDT

© LINA BÖKMARK, AMANDA EKSTEDT, 2026.

Supervisor: Jasmina Maric, Department of Computer Science and Engineering
Advisor: Mirka Kans, Chalmers University of Technology, Projects CirkuTrä &
RE:Furn
Examiner: Sara Ljungblad, Department of Computer Science and Engineering

Master's Thesis 2026
Department of Computer Science and Engineering
Chalmers University of Technology and University of Gothenburg
SE-412 96 Gothenburg
Telephone +46 31 772 1000

Cover: Image of person using the digital tool Cirkulärvägen, generated by AI

Typeset in L^AT_EX
Gothenburg, Sweden 2026

Making Circularity Actionable
An Interaction Design Approach to Identifying Demands
and Developing a Digital Circular Business Model Tool for
Furniture SMEs
LINA BÖKMARK
AMANDA EKSTEDT
Department of Computer Science and Engineering
Chalmers University of Technology and University of Gothenburg

Abstract

This thesis explores how a digital tool can support small- and medium-sized enterprises (SMEs) in the furniture industry in developing circular business models (CBMs). Using a Research through Design approach within a Double Diamond framework, the study combines interviews, iterative prototyping, and usability testing to identify both organizational needs and interaction design demands.

The findings show that furniture SMEs are generally motivated to work with circularity, but often lack structure, guidance, and decision support in the transition process. Based on these insights, a high-fidelity prototype was developed and evaluated. Key design demands included stepwise guidance, concrete decision support, and accessibility for users with low digital maturity.

The study suggests that digital tools can make circular business model development more accessible by transforming complex strategic decisions into understandable and actionable processes. The value of the tool was found not only in its outcomes, but in supporting learning, reflection, and collaboration throughout the transition process.

Keywords: Interaction design, usability, digital tool, circularity, circular economy, business model development, furniture SMEs

Acknowledgements

We would like to express our sincere gratitude to everyone who contributed to this project throughout its different phases.

First, we would like to thank our supervisor from Chalmers University och Technology, Jasmina Maric, for her continuous guidance, valuable feedback, and support throughout the project process. Her insights and encouragement have been highly appreciated during both the research and development work.

We would also like to thank Mirka Kans for her support, expertise, and involvement through the Cirkusträ and RE:Furn projects. Her knowledge of circular business models and the furniture industry provided important perspectives that helped shape the direction of the project.

Furthermore, we are grateful to all interview participants, usability test participants, and expert evaluators who generously contributed their time, experiences, and reflections. Their insights were essential for grounding the project in real-world practices and for continuously refining the developed prototype. We would also like to acknowledge the welcoming and supportive environment surrounding the project, where shared lunches, coffee breaks, and social activities contributed to a motivating and enjoyable atmosphere throughout the process.

Lina Bökmark & Amanda Ekstedt, Gothenburg, 2026-06-05

Contents

List of Figures	xiii
List of Tables	xix
1 Introduction	1
1.1 Aim and Research Questions	1
1.2 Delimitations	2
1.3 The Structure of the Thesis	3
2 Background	5
2.1 Circularity and business model	6
2.2 Stakeholders	7
2.3 Related Work	8
2.4 Research Gap and Thesis Positioning	19
3 Theory	21
3.1 Research through Design	21
3.2 Interaction Design	22
3.3 Interaction Design in Organizational Change	24
3.4 Interaction Design in Circular Economy Contexts	26
4 Methodology	27
4.1 Process Frameworks	27
4.2 Data Collection Methods for Discovering	28
4.3 Data Analysis Methods for Defining	30
4.4 Ideation for Developing	32
4.5 Prototyping Methods for Delivering	33
4.6 Methodological Reliability and Limitations	35
5 Process	37
5.1 Initial Phase	38
5.2 Contextual Phase	39
5.3 Usability Phase	59
5.4 Expert Phase	73
6 Results	77

6.1	What Are Interaction Design Considerations to Support SMEs in Circularity?	78
6.2	Five Identified Design and Usability Themes	83
6.3	Initial High-Fidelity Prototype	84
6.4	Final Prototype from the Fourth Iteration	86
6.5	Overview of the Final Prototype	90
7	Discussion	97
7.1	Discussion of the Process	97
7.2	Discussion of the Results	99
7.3	Respond to the Research Question	101
7.4	Future Work	102
7.5	Ethical and Social Considerations	105
8	Conclusion	107
	Bibliography	109
A	Categories Emerged from KJ Analysis after Interviews	I
B	Requirements and Guidelines after Interviews and Literature study	V
C	Initial Braindrawing Session	XVII
D	Second Braindrawing Session	XXI
E	Low-Fidelity Prototype	XXV
F	Initial High-fidelity Prototype	XXIX
G	Categories Emerged from KJ Analysis after Usability Tests	XXXVII
H	Requirements and Guidelines after Usability test	XLI
I	Refined Prototype	XLVII
J	Final Prototype	LIII
K	Complete List of Requirements and Guidelines	LXXI
L	Script First Individual Interview	LXXXVII
M	Script Individual Interviews	XCI
N	Script Group Interviews	XCIV
O	Script Usability Tests	CI
P	Evaluation after Interviews	CVII

Q Evaluation after Usability Tests	CXXVII
R Compilation of Answers in Usability Tests	CXXXIII
S Result Expert Tests	CLI
T Fulfilled requirements and guidelines	CLXIII

List of Figures

2.1	The relationship between the concepts Business Model, "strategy" and a real-world firm based on an illustration by Seddon et al. [15]	6
2.2	The first two steps of the schematic view of the tool developed by CirkuTrä	12
2.3	The last two steps of the schematic view of the tool developed by CirkuTrä	13
2.4	CirkuTrä's template with the questions to answer to follow the first step of the tool, regarding the current business model	13
2.5	CirkuTrä's template with the questions to answer in the second step of the tool	14
2.6	The 10R circular strategies	15
2.7	The circular activities connected to the strategies mentioned in 2.6 . .	15
2.8	Possible return flows to choose from when moving towards their circular goal	16
2.9	Business models matching the strategies presented in 2.6	16
2.10	Template by CirkuTrä for the business to fill out to identify which customers have similar needs	17
2.11	Template by CirkuTrä to for the businesses to fill out regarding how their costs and revenues are divided	17
2.12	Template by CirkuTrä to asses possible risks with the new business model	17
2.13	The questions to answer to follow the fourth step of defining the new circular business model	18
2.14	The circular business model canvas to fill out as definition of their business model	19
5.1	Modified iterative process model inspired by the double diamond . . .	37
5.2	Overview of the structure of how the KJ analysis went from entered expressions grouped by participant in the left image, to identified categories in the middle image to lastly, refined categories and sub-categories in the right picture	42
5.3	Example showing the layout of requirements and guidelines, where category and prioritization is chosen from a list and definition, cause/effect and prioritization is filled out. The full list is available in Appendix K	43

5.4	Example showing drawings from different stages of the braindrawing session. All drawings are available in Appendices C and D	44
5.5	Home page in its extended form in the low-fidelity prototype	48
5.6	A step's overview and the layout of the summary in the low-fidelity prototype	48
5.7	The carousel cards when entering data in Step 1 and Step 2 and the layout of handling entry-lists in the low-fidelity prototype	49
5.8	Layout for where the user can choose to change the generated value chain and how they change it in the low-fidelity prototype	50
5.9	The layouts of the final summary in the low-fidelity prototype	51
5.10	Representation of the global elements in the tool	52
5.11	Home page in its extended form in the high-fidelity prototype	53
5.12	The overview and summary of the first step in the high-fidelity prototype	54
5.13	The tasks within the first step in the high-fidelity prototype	55
5.14	The actions made through interactions of the strategy list in the second step of the high-fidelity prototype	55
5.15	The first two tasks within the first step in the high-fidelity prototype	56
5.16	The last two tasks within the first step in the high-fidelity prototype	57
5.17	Representation of how a change from the CBMC would generate actions within the interface	57
5.18	The final summary in the high-fidelity prototype	58
5.19	The home page after being done with a process in the high-fidelity prototype	58
5.20	Example of the grouping in the KJ analysis after usability tests	60
5.21	Information pop-up with OK button, and numbering of cards in carousel	69
5.22	Value chains more visually distinguished what is changeable	69
5.23	Choose strategy with updated radio buttons, top bar explaining columns and automatic choice, and summary with check box exchanged	70
5.24	More distinguished clickable elements in CBMC, and updated pop-up for confirming	70
5.25	Summary of the process with more information	71
5.26	Tutorial popup on the Home page	72
5.27	Home page with logo and new progress bar	73
6.1	The surface color and accent colors of the tool, with their component-colors below and color codes respectively	85
6.2	The home page with final progress bar, the last task of one step showcasing the updated button, as well as a summary showing updated text for continuation	86
6.3	The overview of the final prototype showing the updated grouping of tasks, as well as the moved icon for sorting within a list	87
6.4	The final typography and their use within the tool	87
6.5	The overview when completed the first tasks in a step, as well as the listed entries in the overview showing the hierarchy and feedback of new entries	88

6.6	The informational pop-up and final summary with collapsed text segments	88
6.7	The first task of the first and second step showcasing movement of icons, as well as the editing of the value chain in the first step	89
6.8	Home page of the tool when the first step is done, and the second active	90
6.9	Overview and summary of the first step	91
6.10	The tasks in the first step in the tool	91
6.11	Overview and summary of second step	92
6.12	Second step in the tool	92
6.13	Overview and summary of third step	93
6.14	Third step in the tool	93
6.15	Overview and summary of fourth step	94
6.16	Fourth step in the tool	94
6.17	Summary of the process with more information, including regulations	95
E.1	Home page in its extended form in the low-fidelity prototype	XXV
E.2	The initial reach of a step's overview with information pop-up, and when the pop-up is closed in the low-fidelity prototype	XXVI
E.3	The layout of the summary of a step in the low-fidelity prototype . .	XXVI
E.4	The carousel cards when entering data in Step 1 and Step 2 and the layout of handling entry-lists in the low-fidelity prototype	XXVI
E.5	Layout for where the user can choose to change the generated value chain and how they change it in the low-fidelity prototype	XXVII
E.6	The layouts of the non-entry lists in the low-fidelity prototype - the first one has the action to compare, the second one to delegate and the third to choose one or several	XXVII
E.7	The layouts of the entry lists for customers and risks in the low-fidelity prototype	XXVII
E.8	The layouts of the costs and revenue entries and the generated Circular Business Model Canvas in the low-fidelity prototype	XXVIII
E.9	The layouts of the final summary in the low-fidelity prototype	XXVIII
F.1	Home page in its extended form in the high-fidelity prototype	XXIX
F.2	Representation of the global elements in the tool	XXX
F.3	The overview and summary of the first step in the high-fidelity prototype	XXX
F.4	The tasks within the first step in the high-fidelity prototype	XXXI
F.5	The overview and summary of the second step in the high-fidelity prototype	XXXII
F.6	The tasks within the second step in the high-fidelity prototype	XXXII
F.7	The actions made through interactions of the strategy list in the second step of the high-fidelity prototype	XXXIII
F.8	The overview and summary of the third step in the high-fidelity prototype	XXXIII
F.9	The tasks within the third step in the high-fidelity prototype	XXXIV
F.10	The overview of the fourth step in the high-fidelity prototype	XXXIV
F.11	The first two tasks within the first step in the high-fidelity prototype	XXXIV
F.12	The last two tasks within the first step in the high-fidelity prototype .	XXXV

F.13	Representation of how a change from the CBMC would generate actions within the interface	XXXV
F.14	The final summary in the high-fidelity prototype	XXXV
F.15	The home page after being done with a process in the high-fidelity prototype	XXXVI
I.1	Home page during the first and third step, showcasing the development of the progress bar	XLVII
I.2	Information pop-up presented when reaching the first task in the first step, and the first task including the carousel format with more prominent navigation	XLVII
I.3	Information pop-up presented when reaching the second task in the first step, and the second task including the updated value chain maneuver with more prominent visual feedback	XLVIII
I.4	Information pop-up presented previous the second task in the second step, and the second task including the updated list when choosing with choice possibility directly in the list	XLVIII
I.5	Summary in the second step showing updated list with regulations and checkmarks, mirroring the same list in the previous frames extended form	XLIX
I.6	Updated frame when changes have been made from the CBMC in the fourth step, where those changes affect the entries, as well as updated list with only drop-downs when entering customer segment	XLIX
I.7	CBMC with new button as well as dialogue box minimizing risk for error	L
I.8	Changed text fields in the final summary when finalized the process	LII
J.1	Home page in slightly extended form	LIII
J.2	Tutorial available from home page	LIV
J.3	Informational pop-up on first overview - consistent throughout the tool	LIV
J.4	Overview of the first step	LV
J.5	Overview of the first step, when completed the first task	LV
J.6	First task in the first step: analysing the current business model	LVI
J.7	Loading screen generating the value chain in the second task of first step	LVI
J.8	Second task in the first step: reviewing the generated value chain	LVII
J.9	Moving blocks in the value chain in the second task in the first step	LVII
J.10	Adding blocks in the value chain in the second task in the first step	LVIII
J.11	Summary of the first step in the final prototype	LVIII
J.12	Overview of the second step	LIX
J.13	First task in the second step: filling out strategic preconditions	LIX
J.14	Second task in the second step: choosing a circular strategy	LX
J.15	The strategy list in its extended form	LX
J.16	The strategy list when comparing two strategies next to each other	LXI
J.17	Summary of the second step	LXI
J.18	Overview of the third step	LXII
J.19	The first task of the third step, where they delegate circular activities	LXII

J.20	Second task in the third step: choosing return flows	LXIII
J.21	Summary of the third step	LXIII
J.22	Overview of the fourth step	LXIV
J.23	First task in the fourth step: defining the customer segment	LXIV
J.24	Second task in the fourth step: defining costs and revenues	LXV
J.25	Third task in the fourth step: identifying risks	LXV
J.26	Fourth task in the fourth step: reviewing the CBMC	LXVI
J.27	Dialogue box when finalizing the circular business model	LXVI
J.28	Dialogue box when wanting to change an entry in a segment	LXVII
J.29	Feedback when data does not need updating after changes	LXVII
J.30	Feedback when data needs updating after changes	LXVIII
J.31	Home page when done with the process	LXVIII
J.32	Final summary in the final prototype	LXIX

List of Tables

5.1	Overview of study participants	40
5.2	Number of clicks per task compared to the optimal number of clicks per task	62
5.3	Seconds spent by the participants per task compared to the optimal time	62
5.4	Experienced trust expressed by the participants after each usability task	63
5.5	Experienced trust expressed by the experts and initial participants after each executed usability task 1,2 and 3	75

1

Introduction

Considering the environmental impact industries are having on our planet, circular economy (CE) is an increasingly recognized approach to reducing it, formalized through policy frameworks such as the European Union’s CE Action Plan [1]. Central to this transition is the adoption of circular business models (CBMs), business models moving the company towards circular economy [2], which enable more sustainable production and consumption systems. Small and medium-sized enterprises (SMEs) are considered key actors in enabling this transition, yet many struggle to translate sustainability ambitions into practical action, particularly when it comes to adopting CBMs [3]. This challenge is especially evident in material-intensive sectors such as the furniture industry, where limited resources, expertise, and organizational capacity can make larger structural changes difficult to realize.

Existing research has contributed to valuable understanding of the barriers SMEs face when transitioning to CBMs, as well as frameworks intended to guide the process. However, these contributions largely remain at a conceptual level, offering analytical tools and analogue frameworks rather than practical support for moving from idea to concretization. A gap therefore remains in how SMEs can be actively supported through the full transition process. This study examines SMEs within the furniture industry and their transition towards CE. The analogue CBM framework developed by CirkuTrä and RE:Furn [4] is applied within a design process incorporating interviews and user studies with relevant industry actors. The empirical findings are translated into a design proposal: a prototyped digital support tool intended to operationalize the framework and guide furniture SMEs through their transition towards circular business models. The primary focus is on the development process itself, rather than long-term operational use, while maintaining potential for future organizational integration.

1.1 Aim and Research Questions

The aim of this project is to support the transition of furniture SMEs, and potentially SMEs in similar contexts, towards a CE through the development and evaluation of a user-centered digital support tool for circular business model development. While CBMs and related frameworks have been researched and developed, there is still a lack of studies focusing on their practical implementation from a user-centered perspective. To bridge this gap and help operationalize sustainability ambitions

in everyday work practices, this project aims to translate the analogue framework developed by CirkuTrä and RE into a fully interactive prototype adapted to SMEs operational realities.

Through an iterative interaction design process involving interviews, workshops, and usability studies with SME practitioners, the project investigates user needs, barriers, and opportunities related to circular transition. Based on these findings, the study aims to explore how digital tools and interaction design methods can support SMEs in understanding, structuring, and navigating circular business model development in practice, while also contributing knowledge on how complex sustainability frameworks can be translated into accessible and action-oriented digital support systems. Building on the framework developed by CirkuTrä and RE:Furn at Chalmers, this study aims to answer the main research question:

What value can a digital tool provide in supporting furniture SMEs to develop more circular business models?

And to guide the work to answer it, the subordinate questions are:

- *What needs and demands emerge when supporting furniture SMEs in understanding and planning circular business models?*
- *What potential effects can an interaction design process have on furniture SMEs, and on their understanding of developing more circular business models?*

The novelty of this work lies in focusing on the development of circular business models through interaction design, by translating an existing circular business model framework into a digital, user-centered tool tailored to the operational realities of SMEs.

1.2 Delimitations

This thesis was limited by time, five months, and scope - which affected both the development and evaluation of the proposed digital tool. The outcome took the form of an interactive Figma prototype rather than a fully implemented system, meaning that back-end functionality, data persistence, and technical integration are outside the scope of this work. Not all potential functionalities or design iterations could be explored within the given time frame.

User involvement is limited to furniture SMEs in Sweden, in alignment with the scope of the collaborating research projects RE:Furn and CirkuTrä, which focus specifically on this demographic rather than larger companies or other industries. While the literature study draws on international research due to lack of Swedish focused research, the empirical work focuses exclusively on Swedish companies, and primarily those accessible within southern Sweden, due to practical constraints of participant availability. Both the number of companies involved and the number of encounters with each participant are limited by time and availability, which may affect the breadth of feedback collected and the extent to which findings represent

the wider industry. Consequently, the evaluation focuses on usability, relevance, and perceived value rather than long-term effects or large-scale adoption. Given the qualitative and context-specific nature of the study, the findings are grounded in the particularities of the Swedish furniture industry and should be understood as contributing to design knowledge within this specific context rather than as generalizable conclusions.

The thesis builds upon an existing CBM development framework, explained in detail in Chapter 2.3.4, and does not aim to evaluate the environmental impact of specific circular strategies, nor to assess whether the business models developed through the tool are economically viable in practice. The focus is on how such a framework can be translated into a user-centered digital tool. Furthermore, the study addresses the process of developing a new circular business model rather than its subsequent organizational implementation – the tool is designed to support the transition planning phase, not the long-term management of an established circular operation.

1.3 The Structure of the Thesis

This report is structured as follows. Chapter 1 introduces the problem at hand, the aim and research questions of the study, and the delimitations considered. Chapter 2 provides a more detailed description of the context in which this study is situated, positioning it in relation to previously conducted research. The theoretical foundations of the study are presented in Chapter 3, followed by Chapter 4, which describes the methods employed throughout the study, their purpose, and their respective strengths and limitations. Chapter 5 complements this by describing the execution of these methods chronologically within the Double Diamond structure the study followed, together with early prototypes and relevant findings. Chapter 6 presents the results related to the research questions at hand. Finally, Chapter 7 discusses the process and findings alongside considerations for future work, and Chapter 8 draws the study to a close. A full reference list follows, succeeded by appendices that are referenced throughout the report.

2

Background

Swedish homeware design is internationally recognized for its use of wood, neutral aesthetics, and functional compositions rooted in functionalism [5]. With 70% of Swedens land area forested [6], wood is widely available for furniture production, supporting a sector of 2,411 companies in 2023 [7]. Despite largely sustainable forestry, furniture production still has significant environmental impacts from energy use, chemicals, and overproduction driven by fast-changing consumer trends [8]. However, despite strong material availability and design tradition, the industry faces increasing pressure to rethink production, use, and end-of-life management, particularly in relation to circular resource flows. This study focuses specifically on Swedish furniture SMEs, where material intensity and production practices make the transition to CBMs both highly relevant and practically challenging.

To address these challenges, previous research emphasizes transitioning to circular business models, where principles such as reducing waste, enabling reuse, and systems thinking are central [9]. In the furniture sector, this may involve repairing or reupholstering products instead of replacing them, or offering leasing rather than ownership. Bocken et al. [10] describe these types of strategies through sustainable business model archetypes, including *create value from waste*, *deliver functionality rather than ownership*, and *adopt a stewardship role* [10]. Translating these archetypes into practice requires rethinking not only materials, but how value is created, delivered, and captured across the entire business model.

Prior studies also indicate that transitioning to circular furniture flows can reduce climate impact - a study by RISE estimates a reduction of approximately 20–40% compared to traditional linear models [11]. Despite this potential, many furniture companies primarily focus on incremental improvements in production efficiency, while broader changes related to business models and product life cycles remain challenging to implement.

Several frameworks for CBMs exist, but practical implementation remains challenging for small and medium-sized enterprises with limited resources. The research projects CirkuTrä and RE:Furn provide a structured framework for developing CBMs, highlighting environmental consequences of linear production and emerging consumer expectations [12]. However, its practical application in SMEs daily workflows remains limited, creating a need for user-friendly digital tools that translate the framework into actionable practices - a challenge where interaction design plays a central role.

2.1 Circularity and business model

Circular economy (CE) can vary in definition. European Parliament [13] define it as *a model of consumption and production to extend the life cycle of products* through sharing, leasing, reusing, repairing, refurbishing and recycling, reducing waste by keeping materials within the economy as long as possible. Circular Sweden [14] take a broader view, defining CE as *an industrial system designed to preserve value by replacing linear flows with prolonged life span and preservation of products and materials value*, encompassing a shift towards renewable energy and elimination of waste through design of materials, products, systems and business models. In this report, the definition by European Parliament [13] is primarily used, with the understanding of CE as an industrial system as described by Circular Sweden [14].

Both **business models and strategies** guide how companies move forward, though their meanings vary across authors. Seddon et al. [15] distinguish the two by describing business models as inward-looking, focusing on the firms activity system and how it creates economic value, while strategy is outward-looking and concerned with competitive positioning. They illustrate this relationship through a Venn diagram in which one or more business models are positioned as smaller circles within a broader strategy, shown in Figure 2.1. Along an axis of abstraction, strategy represents an abstraction of the company, while business models are abstractions of the strategy. In broad terms, strategy defines how a company competes in its environment, whereas the business model specifies the internal steps required to successfully enact that strategy. This relationship is further elaborated in the *Business Model Canvas* by Osterwalder and Pigneur [16], which outlines building blocks for structuring a business model in alignment with the firms strategy.

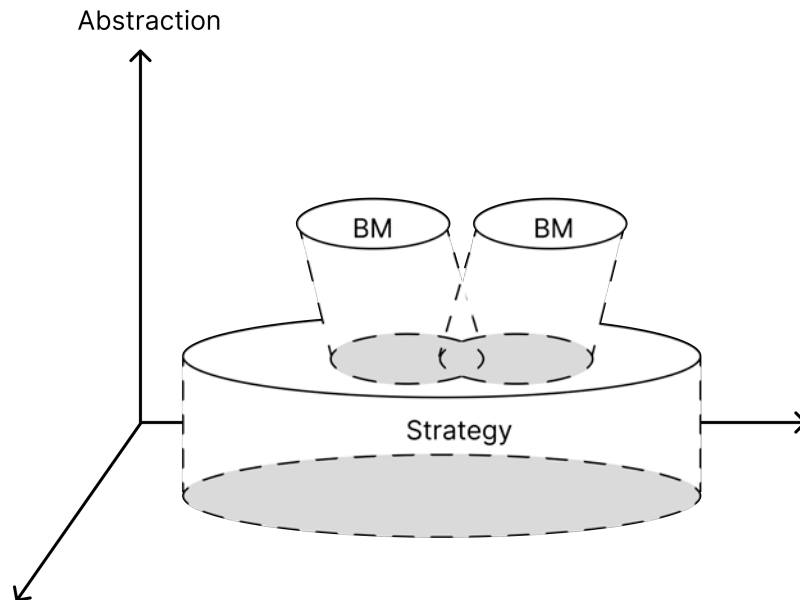


Figure 2.1: The relationship between the concepts Business Model, "strategy" and a real-world firm based on an illustration by Seddon et al. [15]

When understanding the CE, it is clear that to reach it, companies need to apply circular strategies and to succeed they need to develop **circular business models (CBMs)**. But what a CBM means can be difficult to grasp. NuSSholz [2] have conducted research on several literary fields within the subject and defined the concept. They describe how CBMs support the development of product systems that incorporate strategies to preserve the embedded value at the highest possible level of utility. Their definition, which should be considered for this project, is that a CBM is *"how a company creates, captures, and delivers value with the value creation logic designed to improve resource efficiency through contributing to extending useful life of products and parts (e.g., through long-life design, repair and remanufacturing) and closing material loops."* [2, p. 12].

2.2 Stakeholders

According to European Commission [17], **small and medium-sized enterprises (SMEs)** represent 99% of all businesses. Their definition of SMEs is that they are Micro-sized if they have less than ten staff, they are small if they have less than 50 and they are medium sizes if less than 250 staff are employed. In this definition, they also include the businesses' turnover. For the micro-sized, it should be no more than two million euros, for small sized no more than ten million and for medium sized no more than 50 million euro.

CirkuTrä and RE:Furn are Swedish research initiatives involving multiple universities and industry partners within the furniture and wood manufacturing sectors. CirkuTrä is a research program that aims to strengthen circularity in the wood manufacturing industry [18]. It adopts a value-chain perspective, focusing on reuse and remanufacturing, and develops technical, organizational, and strategic frameworks to enable sustainable industrial transformation. RE:Furn is an applied research project focused on remanufacturing furniture in public sector contexts and in collaboration with the furniture industry [19]. It develops and tests production strategies and practical solutions to support furniture manufacturers and public actors in implementing circular practices. These initiatives constitute a central part of the empirical and theoretical foundation of this study.

Through the CirkuTrä and RE:Furn initiatives, strategic frameworks, guidelines, and workshop-based methods have been developed to support increased circularity within the wood-processing and furniture industries. These contributions include structured models for understanding circular strategies, value chains, and stakeholder roles, as well as practical formats for organizational reflection and business model development [4]. This framework lay as basis for the digital tool in this project, and are presented in Chapter 2.3.4. These initiatives primarily operate at strategic, educational, and organizational development levels.

2.3 Related Work

Previously, this area has been studied in different aspects and their contributions to this project will be presented here, both in the aspect of theoretical knowledge or findings to build upon. The research projects RE:Furn and CirkuTrä have done substantial work on this, which together with other scientific research, is the basis of this project.

2.3.1 Circular Economy in the Furniture Sector

Existing research and development efforts within the field of circular economy (CE) in the furniture sector have primarily focused on frameworks, strategies, and conceptual models for circular transition rather than on practical implementation tools. Several degree projects and research initiatives have addressed CE within furniture SMEs, highlighting structural challenges, material flows, business model transformation, and sector-specific barriers [4, 20, 21, 22]. These works contribute substantial theoretical knowledge and sectoral understanding but rarely result in operational tools that can be directly integrated into SMEs everyday practices.

The environmental potential of circular business models in the furniture sector has been documented, with life-cycle analyses indicating reductions in climate impact of approximately 20-40% compared to traditional linear models, alongside a roughly 50% reduction in material resource input [11]. However, realizing these benefits is contingent on the business model's ability to genuinely extend the lifespan of products - circularity alone does not guarantee reduced environmental impact [11].

Research on the Swedish furniture industry specifically points to a growing demand for circular practices, particularly from public sector customers, while simultaneously identifying persistent barriers to adoption [23]. These barriers span technological, structural, market, and cultural dimensions [4], and include challenges such as poor logistics, suboptimal product design, lack of traceability, profitability concerns, and insufficient customer awareness [20, 23]. Actor constellations also become significantly more complex as circular strategies become more ambitious, requiring companies to establish and manage new relationships with a broader set of direct and indirect stakeholders [23].

Case studies of individual companies, such as an analysis of Materia's reuse concept called "re-loved", mentioned in thesis by Pettersson Borg and Johansson [24], illustrate both the potential and the practical difficulties of implementing circular business models. Common challenges include higher operational costs compared to new production, low customer loyalty, and lack of standardized processes - all of which point to a need for structured support in circular transition [24].

2.3.2 Barriers and Enablers for Circular Implementation

Research has also focused on identifying barriers and enablers for circular implementation within SMEs. Studies within the CirkuTrä and RE:Furn projects have mapped conditions for effective remanufacturing and circular transition in the

Swedish furniture sector, including systemic, organizational, product-related, and market-related factors [20, 25]. Kans and Löfving [26] further define influential structural conditions in the European wood products industry. Outside these initiatives, Rizos et al. [3] analyze barriers and enablers for CBM implementation in SMEs through comparative empirical studies, highlighting discrepancies between strategic ambitions and everyday organizational constraints.

Flintberg [21] researches the possibilities and challenges related to the furniture industries possibility of moving towards CE. They identified technological barriers in regards of specific techniques in the new processes, often a combination of process complexity and lack of knowledge of the process. There are also barriers with regulations, where they can be difficult to grasp and follow, also along their changeability over time, and that they depend on economic possibilities. The economic barrier in general is of larger scale where a change in organization often requires plenty of processes demanding both money and time. Lastly, they identify the barrier of internal attitude where it can be difficult to collectively shift from a linear market to a circular. This is also strongly pointed out in the research by Hetti-Arachchige et al. [20] where a clear barrier in remanufacturing is identified as the company not knowing how to achieve circular business models, showing clear internal knowledge gaps. These are barriers to consider when developing ways of guiding businesses towards CE.

Regarding barriers for circular implementations in SMEs in particular, the most prominent is lack of capital, identified by around 50% of SMEs in an article by Rizos et al. [3], who note that circular transitions require substantial upfront investment in areas such as reverse logistics, lifecycle monitoring, and R&D. This is echoed by the rural SME study by Uvarova et al. [27]. The lack of government support and effective legislation is raised by 25% of SMEs in Rizos et al. [3] where the study by Uvarova et al. [27] adds that support programs are largely targeted at medium and large companies, leaving SMEs without adequate institutional backing and understanding. Another highly identified barrier is the lack of information [3, 27], where most European firms had either never heard of the CE or could not understand its meaning, and that even aware firms show a significant gap between knowledge and action. Uvarova et al. [27] similarly highlights lack of knowledge about procedures and relevant frameworks.

Lack of technical and technological know-how is often intertwined with resource constraints, where SMEs lack both the expertise and the time to acquire it [3, 27]. The administrative burden of reporting, certifications, and compliance is also raised by 21% of SMEs in Rizos et al. [3] as a practical barrier, particularly for smaller organizations without in-house expertise. Lastly, similarly to the attitude towards CE in general, company environmental culture is identified as a barrier [3]. This includes resistance to change among managers and employees through a lack of innovation culture and slow adaptation to changing market conditions.

Rizos et al. [3] also identify enablers within SMEs to focus on. One of them is networking, identified by 34% of SMEs in their work as a key enabler, including participation in communities of practice, supply chain partnerships, and groups of

like-minded SMEs. Both Rizos et al. [3] and Uvarova et al. [27] emphasize that the circular transition depends on collective effort and knowledge sharing across the value chain. Besides these enablers, Hobro [22] discuss some identified ways of overcoming the mentioned challenges, where improving communication and education and practices on principles for CE can empower the staff and stakeholders in making actively and participating in circular initiatives. Also the development of clear guidelines is seen as essential to reach effective decision-making.

2.3.3 Existing Strategic Frameworks and Conceptual Models

CE strategies are frequently structured through conceptual frameworks, the most well-known of which is the **10R-strategies** (Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, Recover) [28], which are explained more in depth in Chapter 2.3.4. These frameworks provide normative guidance for waste prevention, life extension, and material recovery and are widely applied in research on circular transition, including in Kans et al. [4]. While such models offer valuable prioritization principles and systemic perspectives, they remain largely conceptual and require translation into operational practices within organizational contexts.

Another widely used framework for understanding and developing business models is the **Business Model Canvas (BMC)** by Osterwalder and Pigneur [16], which also is explained more in depth in Chapter 2.3.4. The BMC consists of nine building blocks used to visualize how a company creates, delivers, and captures value. Due to its accessible and visual structure, it has become a common tool in strategy development and innovation processes. However, a limitation of the traditional BMC is that each canvas often represents a single static state of the business model. This makes it difficult to understand how a business model changes over time, or what specific steps are required to move from one state to another. To address this limitation, Fritscher and Pigneur [29] propose a **digital approach** in which business model evolution can be represented through layers, mutations, and branching future scenarios.

As these two examples entails, circular transitions typically involve a sequence of smaller strategic adjustments rather than one complete redesign. To address this, business model development can be understood as a set of incremental changes, such as adding, removing, or modifying business model elements [29]. This perspective is particularly relevant for SMEs, where circular transformation may need to occur gradually due to uncertainty, time constraints, and limited resources.

Digital tools can further extend the usefulness of such frameworks by enabling versioning, comparison of alternatives, collaboration, and documentation over time. Research on software-based business model development tools also highlights that no clear consensus exists regarding which functions such tools should include, indicating an underexplored design space where interaction design can contribute. Szopinski et al. [30] note that digital tools can support collaboration, versioning, and documentation beyond traditional paper-based methods.

Beyond academic literature, practitioner-oriented tools have also emerged to support circular transformation in organizations. RISE Research Institutes of Sweden has developed several tools for circular transformation [31], including the toolkit **Circular Coaching Essentials**, produced within the research project *Cirkulär affärsutveckling i praktiken*. It is aimed at innovation coaches supporting SMEs and includes **conversation guides** for exploring circular opportunities, **financial calculation tools** for assessing value and profitability, and **documentation templates** for capturing learnings. While useful in ongoing processes, it is not designed to guide firms independently through full circular business model development.

Another example is the **Progression Model**, a self-assessment tool developed within the *Data → Business* project - an Interreg-funded initiative involving the University of Borås, Interior Cluster Sweden, and partners [32]. It helps manufacturing companies assess their sustainability maturity across areas such as strategy, product development, and production, typically within a two-hour workshop. The tool is mainly used as an initial baseline assessment rather than continuous development support.

While resources such as these provide valuable process support and sector-specific relevance, they often address sustainability maturity or financial assessment at a broad level rather than guiding companies through the specific process of developing a circular business model step by step. This is particularly relevant for furniture SMEs, where several studies have identified a need for accessible, structured, and independently usable tools [4, 20, 22]. This is especially important in the context of the present project, which aims to support furniture SMEs in understanding not only what a more circular business model could look like, but also how to transition towards it through a clear step-by-step process.

The Swedish research initiatives **CirkuTrä** and **RE:Furn** have developed sector-specific models, methods, and workshop material aimed at supporting circular transition in the wood and furniture industries. These frameworks combine principles from circular strategy literature with practical guidance adapted to industry conditions such as remanufacturing, material flows, stakeholder collaboration, and business model development [4, 12]. It has resulted in a specified framework used in workshops to help furniture SMEs along each step of the way of developing new CBMs. Unlike the frameworks and tools reviewed above, which address individual aspects of the circular transition, the CirkuTrä and RE:Furn framework encompasses the complete process of developing a new CBM. For this reason, it serves as the foundational structure that this project builds upon, translating it into an interactive digital format intended to support practitioners in applying the material independently and step by step.

2.3.4 Framework from CirkuTrä and RE:Furn

The developed framework from the research projects CirkuTrä and RE:Furn includes appropriate templates of how SMEs can transform their business model from their current to a more circular one. This is applicable to all SMEs independently of how their business model looks today, instead of being designed for specific current busi-

ness models. It is today used in workshop environments to spark conversation and thought, but not available for companies to follow exclusively. To further develop this, this framework will be used as a base for the digital tool in this study and is explained in this chapter. It is visualized in its original form, in Swedish, with explanations to the different frames and steps.

The framework serves as the analytical and structural foundation of this study. As presented in the article by Kans et al. [4], the framework proposes an approach for establishing circular business models consisting of four steps as seen in Figure 2.2 and 2.2. The first step consists of *analyzing the current business model*. The second step is to *identify future circular possibilities* using the 10R-strategy framework to create a new circular strategy. The third step is to *choose the new CBM* to implement the new strategy in relation to organizational conditions. Lastly, the fourth step is to *describe the new circular business model* through a Circular Business Model Canvas. The framework provides a structured process logic that is used as the basis for the design and development of the digital support tool in this study.

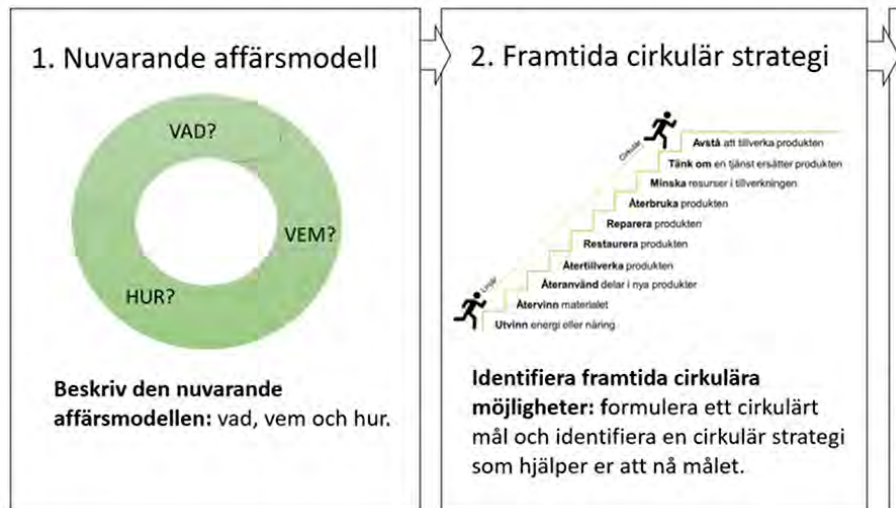


Figure 2.2: The first two steps of the schematic view of the tool developed by CirkuTrä

When the companies follow this framework, the first step is to **analyze their current business model**. To do this there are a few questions CirkuTrä have formulated to guide them. As seen in Figure 2.4, these start by questioning *What?*: What does the business do?, What need are they fulfilling?, and What problems are they solving?. They then answer the questions regarding *Who?*: Who is the customer or group they are targeting?, What needs and problems does this target group have?, How do they reach this target group?, and what collaboration do they need in this?. Lastly, they answer the *How?*: How are they fulfilling the target group's needs or solving their problems?, Which are the most important activities for this?, and which competencies and resources are important?. When these questions are reflected upon and answered, they will have a better objective understanding of how they are working today and what their important aspects are.

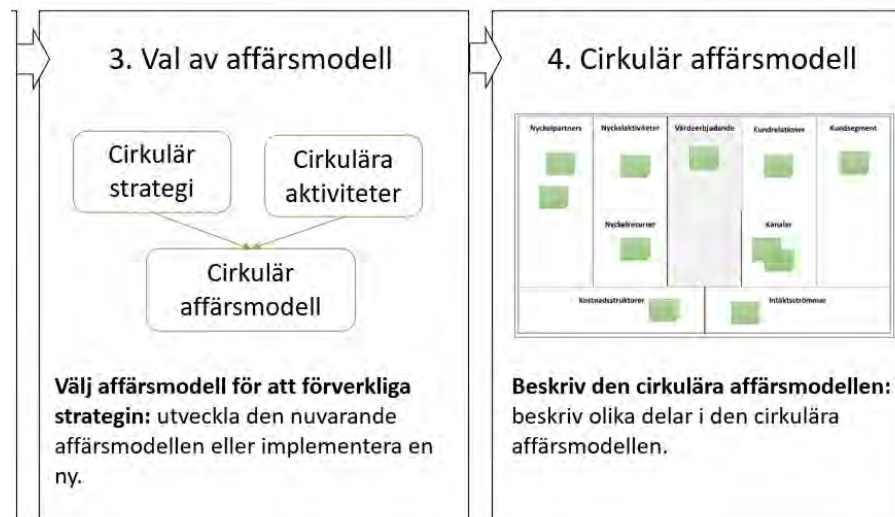


Figure 2.3: The last two steps of the schematic view of the tool developed by CirkuTrä

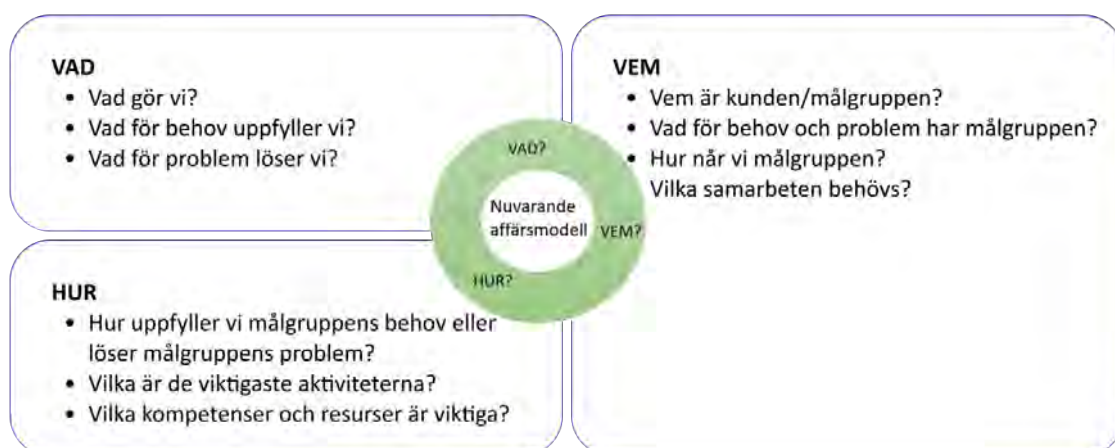


Figure 2.4: CirkuTrä's template with the questions to answer to follow the first step of the tool, regarding the current business model

2. Background

The second step, **identifying future circular possibilities**, is more extensive to follow. To start, the business should try to identify their goals towards circularity. They do this by answering the questions presented in Figure 2.5. Regarding *Resources and Waste*: Which resources can be used better?, and What residual waste can be used instead of thrown away?. In considerations of their *Customers and partners* they should reflect upon: which circular needs their customers have, which partners have circular needs or problems that they can help solve, and which partners could help them solve their customers' circular needs. Lastly, they need to reflect upon what their own *Circular goals* are.



Figure 2.5: CirkuTrä's template with the questions to answer in the second step of the tool

When these questions are answered, they review the existing circular strategies, to choose which ones could help them towards their goal. These strategies are the 10R-strategies and are built as a ladder with the steps seen in Figure 2.6 and described by Malooly and Daphne [28]. The lowest step is the strategy closest to a linear one and the top one is the closest to a fully circular one. The two lowest steps are strategies within smart use of material in the end-of-life phase, to *recover* energy from waste and *recycle* materials from used products to make new ones. During the consumption phase there are five strategies to prolong the life-cycle of the product and its components. The lowest of them being to *repurpose* parts of the product to create new ones. Then there's the strategy to *remanufacture* the product by disassembling its parts to use in a new product of the same function, to *restore* it by making a worn-out product usable again, to *repair* it by maintaining it and at the top of this phase is the strategy to *reuse* the product in its entirety. The earliest phase, the design phase, have three strategies to work towards smart products, services and production. These steps are to *reduce* resources used in production, *rethink* if a service can replace a product, making the use of the product more intense, and lastly the *refuse* the production of a product, making its function superfluous by offering it in a different product or service.

Once these strategies have been reflected upon and decided between which are most relevant for the business to reach its circular goal, they can move on to the third step of **choosing a business model**, by firstly delegating circular activities. Without

	Strategi	Vad innebär strategin?	
	Avstå att tillverka produkten	Gör produktens funktion överflödig, samma funktion erbjuds i annan produkt	
	Tänk om en tjänst ersätter produkt	Gör användningen av produkten mer intensiv	
	Minska resurser i tillverkningen	Gör tillverkningen effektiv så att produkter kräver färre resurser	
	Återbruka produkten	Gör produkten, med dess ursprungliga funktion, användbar för ny konsument	
	Reparera produkten	Underhåll en produkt för att förlänga dess livslängd	
	Restaurera produkten	Gör en uttjänt produkt användbar igen	
	Återtillverka produkten	Demontera produkten, återanvänd delar i ny produkt med samma funktion	
	Återanvänd delar i nya produkter	Förvandla uttjänta produkter till delar i produkter med ny funktion	
	Återvinn materialet	Ta vara på material från uttjänta produkter och använd i nya produkter	
	Utvinn energi eller näring	Förvandla avfallsmaterial till energi eller näring	

Figure 2.6: The 10R circular strategies

circular activities the chosen strategies have no way of being put into action and a business model cannot be followed. The chosen strategy have specific circular activities to follow, which in this step needs to be decided upon who executes each activity. In Figure 2.7 the activities connected to the 10R-strategies are presented from how CirkuTrä have established them.

	Strategi	Cirkulära aktiviteter kopplat till strategin
	Avstå att tillverka produkten	Samverkan
	Tänk om en tjänst ersätter produkten	Returflödeslogistik, uthyrning, avsyning, (eventuellt) reparation, distribution
	Minska resurser i tillverkningen	Hållbar/cirkulär design och materialval, materialåtervinning
	Återbruka produkten	Returflödeslogistik, avsyning, (eventuellt) reparation, försäljning, distribution
	Reparera produkten	Returflödeslogistik eller mobila serviceenheter, avsyning, reparation, distribution
	Restaurera produkten	Returflödeslogistik, avsyning, restaurering, distribution
	Återtillverka produkten	Returflödeslogistik, demontering, sortering, avsyning, återtillverkning, distribution
	Återanvänd delar i nya produkter	Returflödeslogistik, demontering, sortering, avsyning, uppgradering
	Återvinn materialet	Returflödeslogistik, avfallshantering, demontering, sortering, återvinning
	Utvinn energi eller näring	Returflödeslogistik, avfallshantering, utvinning av energi/näring

Figure 2.7: The circular activities connected to the strategies mentioned in 2.6

Depending on the strategy, return flows might be an activity to include and thus becoming a bigger part of the new business model. To help with this, CirkuTrä have provided a list of different ways return flows can be used and followed successfully. This list is presented in Figure 2.8 and can be ownership based, service based, order or project based, deposition based, point based, repurchase based or voluntary. The company can choose one or several of these to include in their business model.

2. Background

Typ	Beskrivning	
Ägandebaserat	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionsavtal	
Serviceavtalsbaserat	Denna typ av relation är baserad på ett serviceavtal mellan en tillverkare och en kund som inkluderar återtillverkning	
Order/projektbaserat	Kunden returnerar den använda produkten för återtillverkning	
Depositionsbaserat	När kunderna köper en renoverad produkt är de skyldiga att returnera en liknande använd produkt och därmed också agera som leverantör	
Poängbaserat	När kunderna returnerar en begagnad produkt får de en specifik antal poäng för den returnerade produkten. Dessa poäng används sedan som en rabatt vid köp av en renoverad produkt	
Tillbakaköpsbaserat	Återtillverkaren köper de önskade begagnade produkterna från en leverantör som kan vara slutanvändare eller en avfallshanterare	
Frivilligt	Produkter ges tillbaka frivilligt	

Figure 2.8: Possible return flows to choose from when moving towards their circular goal

Based on their goals, strategies and activities identified, the new circular businesses is provided from the list in Figure 2.9. The list consists of business models identified through research by CirkuTrä connected to the different strategies.

	Strategi	Matchande affärsmodeller	
	Avstå att tillverka produkten	Funktionsförsäljning: en funktion eller prestanda ersätter en produkt.	
	Tänk om en tjänst ersätter produkten	Vara som tjänst eller funktion: produkter hyrs/leasas istället för köps och ägs av användaren. (Service och reparationer kan ingå.)	
	Minska resurser i tillverkningen	Hållbarhet som värdeerbjudande: hållbart designade och producerade produkter.	
	Återbruka produkten	Livstidsförlängning genom återbruk: Secondhandförsäljning av produkter.	
	Reparera produkten	Livstidsförlängning genom renovering: <u>Repareringstjänster</u> i fabrik eller på plats hos kund.	
	Restaurera produkten	Livstidsförlängning genom restaurering: Renoveringstjänster i fabrik.	
	Återtillverka produkten	Återanvändning vid livscykelsslut: återtillverkning i fabrik.	
	Återanvänd delar i nya produkter	Återanvändning vid livscykelsslut: återanvändning av delar i fabrik.	
	Återvinn materialet	Cirkulära råvaror: produkter skapas av återvunnet och återvinningsbart material istället för med jungfruliga råvaror.	
	Utvinn energi eller näring	Avfallshantering: material sorteras och tillvaratas för att kunna cirkuleras/utvinnas.	

Figure 2.9: Business models matching the strategies presented in 2.6

When this is chosen, the fourth step of fully **describing the new business model** can be initiated. They first describe the customer segment, through a template seen in Figure 2.10 to identify which customers have similar needs and can therefore be grouped. To get a full understanding of how this business model will affect their costs and revenues, they follow the template in Figure 2.11 and get an overview of how their business is cost- or revenue driven. It is also needed to assess what possible risks will be present. To do this, CirkuTrä has a template for the businesses to reflect upon and fill out, seen in Figure 2.12.

Kund	Beskrivning

Vilka kunder har liknande behov?

- kräver och rättfärdigar ett distinkt erbjudande
- nås via olika distributionskanaler
- kräver olika typer av relationer
- når vinst på substantiellt olika vis
- villiga att betala för olika aspekter av erbjudandet

Figure 2.10: Template by CirkuTrä for the business to fill out to identify which customers have similar needs

Kostnader	Beskrivning	Intäkter	Beskrivning
Arbetskraft		Produktförsäljning	
Material och komponenter		Ytterligare produktintäkter (service)	
Tillverkning (inklusive energi)		Prispremier	
		Pay per use	
		Prenumeration	
Avfallshantering		Leasing, uthyrning	
Service			
Transport		Transaktions- eller fastprisavtal	
Administration		Leasingkontrakt	
Investeringar		Prestationsbaserade kontrakt	
		Långtids / helhetskontrakt	

Figure 2.11: Template by CirkuTrä to for the businesses to fill out regarding how their costs and revenues are divided

Typ av risk	Beskrivning	Kritikalitet (Sannolikhet x konsekvens)	Hur hanteras risken?
Kund- relaterad			
Värde- erbjudande			
Infrastruktur			
Ekonomisk			
Extern			

Figure 2.12: Template by CirkuTrä to asses possible risks with the new business model

2. Background

With all these parts discussed and defined, they answer the *What?*, *Who?* and *How?* again but with circularity in mind as through the template shown in Figure 2.13. From this they can move forward to follow the circular business model canvas stemming from the BMC by Osterwalder and Pigneur [16], but with added circularity. This canvas is presented in Figure 2.14. In a planned workshop with manufacturers, CirkuTrä also provides examples of what this canvas can include depending on what kind of business model they are implementing, e.g. to rent or lease a product, reusing products or when repairing or restoring products.

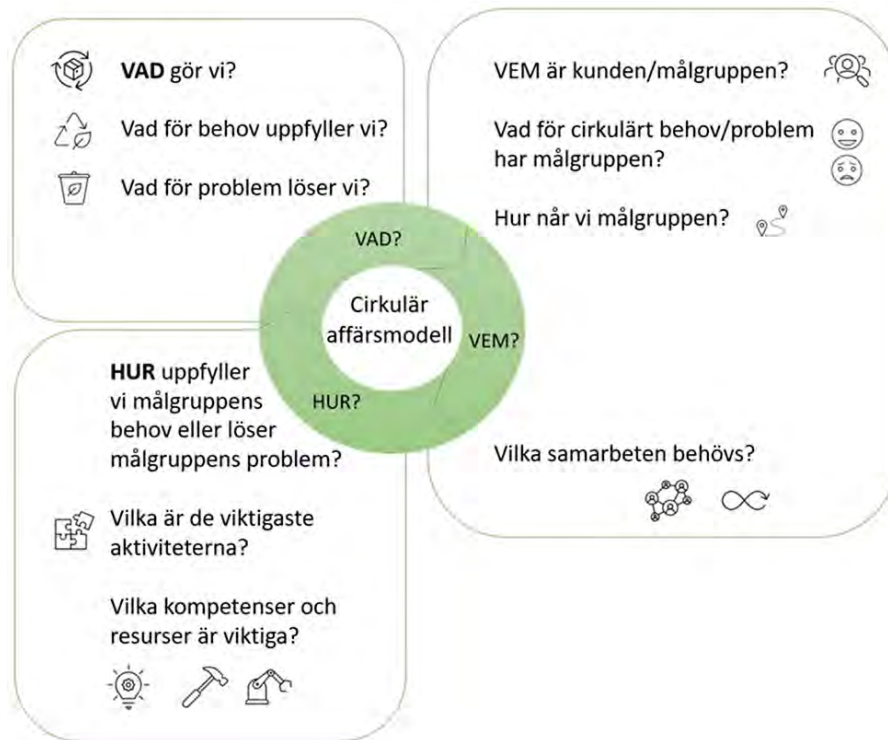


Figure 2.13: The questions to answer to follow the fourth step of defining the new circular business model

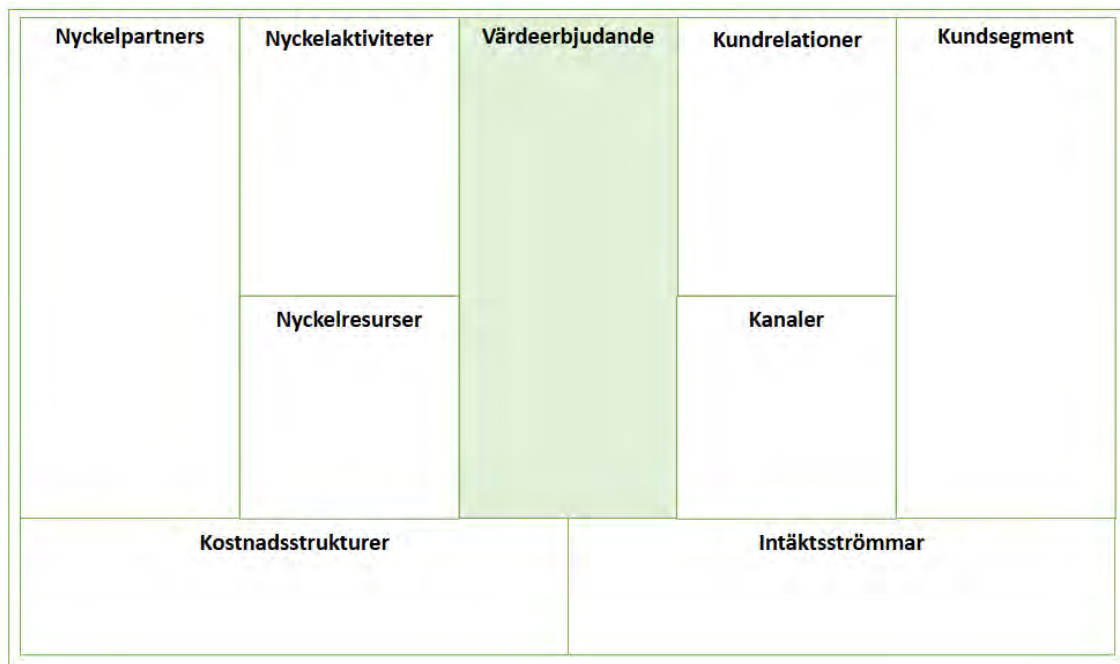


Figure 2.14: The circular business model canvas to fill out as definition of their business model

2.4 Research Gap and Thesis Positioning

Collectively, previous research demonstrates that the transition toward circular business models has been extensively explored at a strategic and conceptual level. Existing studies provide circular economy principles, business model frameworks, maturity models, and analyses of organizational barriers related to circular implementation within furniture SMEs [3, 4, 28]. Research has also identified a range of structural, organizational, and cultural challenges associated with circular transition, including limited resources, lack of knowledge, and difficulties translating sustainability ambitions into everyday practice [20, 22, 27]. At the same time, several initiatives and practitioner-oriented tools have emerged to support circular transformation processes. However, these primarily focus on strategic mapping, assessment, or workshop facilitation rather than continuous and independently usable support throughout the development process.

While previous work clearly defines *what* circular transition entails [24, 28] and *why* it is necessary [11, 21], less attention has been paid to *how* furniture SMEs can be practically supported in operationalizing circular business models within everyday organizational contexts. Existing research and initiatives provide strategies, frameworks, and workshop-based guidance, but these are often perceived as complex, resource-demanding, and difficult to operationalize independently within SMEs [3, 22].

Although the framework developed through CirkuTrä and RE:Furn offers more comprehensive process support than many existing approaches, it remains primarily analogue and workshop-oriented. As a result, there is still limited knowledge regarding how such frameworks can be translated into user-centered digital support systems that enable step-by-step guidance, organizational reflection, and actionable decision-making in practice.

Taken together, the literature suggests that the primary challenge is no longer defining circular principles or identifying sustainability strategies, but supporting SMEs in operationalizing these within their everyday work practices. This is particularly relevant within the furniture sector, where circular transition involves complex coordination between materials, products, services, stakeholders, and long-term business model changes.

This thesis positions itself at the intersection of circular economy (CE) research, business model innovation, and interaction design. Rather than contributing new theoretical models for circular business development, the study builds upon existing frameworks, strategies, and transition models developed within previous research and initiatives such as CirkuTrä and RE:Furn. The contribution instead lies in investigating how these strategic and conceptual resources can be translated into a practical, user-oriented digital support system adapted to the conditions of furniture SMEs.

From an interaction design perspective, the thesis contributes knowledge about how complex sustainability frameworks can be operationalized through user-centered digital design. By focusing on usability, accessibility, organizational needs, and step-by-step guidance, the study explores how interaction design can support SMEs in understanding, structuring, and navigating circular business model development processes. In this sense, the work contributes not primarily through technological implementation, but through the design and evaluation of a digital mediation layer between strategic sustainability knowledge and everyday organizational practice.

Although the study is grounded in the Swedish furniture industry and the context of SMEs, the findings may also have broader relevance for other sectors facing similar challenges related to circular transition, limited organizational resources, and the practical implementation of sustainability strategies. The thesis therefore contributes to ongoing discussions regarding how digital tools and interaction design methods can support organizational transformation toward more circular and sustainable ways of operating.

Consequently, there is a need to investigate how interaction design and digital tools can support SMEs not only in understanding circular business models conceptually, but also in navigating the practical transition process in a more accessible and structured manner. This includes understanding what needs and demands furniture SMEs have when engaging with such processes, as well as what effects digital support tools may have on their understanding and development of circular business models.

3

Theory

This chapter presents theories and concepts relevant to this thesis. It focuses on interaction design, digital tools, and how these can support SMEs in developing more circular business models. These are used throughout the project in e.g. the layout of the process and in decision-making for the design of the tool.

3.1 Research through Design

Research through Design (RtD) is an approach within interaction design and design research where knowledge is generated through the process of designing and engaging with artifacts [33]. Rather than treating design alone as producing a final solution, RtD instead treats the act of designing as a central way of exploring and generating knowledge.

This approach is particularly relevant in contexts where problems are complex and not fully defined from the start [33]. Instead of aiming to test predefined hypotheses, it allows research questions and insights to evolve throughout the design process. Through iterative cycles of designing, prototyping, and evaluating artifacts, researchers can explore possible directions or future scenarios, uncover user needs, and reflect on how design decisions shape interactions and outcomes [34].

A key characteristic of RtD is the role of the artifact in the research process. In this approach, the artifact is not considered the final outcome or solution, but rather a means for generating and articulating knowledge. As described by Zimmerman et al. [33], design artifacts function as research contributions that embody insights and enable reflection on both the design process and its outcomes. Through the creation and evaluation of artifacts, researchers can explore design possibilities and develop knowledge grounded in practice [35]. This also means that the design process itself becomes a way of thinking through the problem.

RtD often involves user-centered and iterative processes, where stakeholders are engaged through methods such as interviews, workshops, and usability testing [35]. These activities support the continuous refinement of both the artifact and the understanding of the problem space. The knowledge generated is typically practice-based, including insights into user needs, design requirements, and interaction patterns.

One of the strengths of RtD is that it allows researchers to engage with complex, real-world problems by combining making of artifacts and reflection of following insights throughout the process [33]. Rather than focusing only on analyzing existing situations, this approach also enables the exploration of possible futures and testing ideas through design. This makes it particularly relevant within interaction design, where the outcome often involves shaping new kinds of interactions and practices [36, 37]. In this way, RtD can generate knowledge that is closely connected to practice and directly applicable in design contexts. At the same time, RtD comes with challenges. The knowledge produced is often tied to a specific context and design case, which can make it difficult to generalize [33]. There is also a risk that the artifact is perceived as the main contribution, rather than as a way to generate insights [33]. This puts greater responsibility on the researcher to clearly reflect on and communicate how knowledge emerges through the design process.

In this study, RtD serves as the overarching methodological approach. The prototyped digital tool functions not only as a deliverable but also as a research instrument, where design decisions and user responses constitute data that inform the research contribution. The interaction design needs and demands that emerge through this process form the primary research contribution.

3.2 Interaction Design

Interaction design is a practice-based discipline concerned with shaping the relationships between people and the systems they use [37]. It draws on knowledge from human-computer interaction, cognitive science, and design theory to create digital experiences that are not only functional, but meaningful, learnable, and aligned with how people actually think and work [35]. User-centered methods such as ideation, prototyping, and testing are central within interaction design. These methods help ensure that digital tools are designed around user needs, expectations, and real use contexts. Rather than focusing solely on visual or technical output, interaction design involves understanding user contexts, behaviors, and mental models - and translating that understanding into structured, intentional design decisions [37].

The approach is commonly operationalized through iterative and exploratory design processes, where early ideas are externalized through sketches, paper prototypes, and progressively refined digital prototypes [35]. This allows designers to explore and evaluate interaction concepts before implementation. Prototyping is often combined with user-centered evaluation activities, such as usability testing and iterative feedback loops, to ensure alignment between design intentions and user needs [33, 35, 38, 39]. A key aspect of this process is that design artifacts function as intermediaries between abstract ideas and concrete system behavior, enabling continuous refinement of interaction structures throughout the design process [33].

Interaction design requires a holistic approach in which multiple dimensions are considered throughout the design process, from the choice of words, visual hierarchy, and spatial layout, to the flow of interactions over time and the behaviors users bring to the system [35]. Methods such as user-centered research, iterative prototyping, and usability testing are central to this work, enabling designers to ground decisions in real user needs and refine the interaction continuously. It is therefore a discipline concerned with structuring digital behaviors, mediating information, and shaping how users engage with complex systems. When digital tools are introduced in organizational settings, they influence how processes are understood, prioritized, and enacted. Designing such tools involves translating abstract concepts and frameworks into structured, actionable interactions that fit within the realities of those who use them.

3.2.1 Usability in Digital Tools

When designing physical or digital products, usability is a central concept for ensuring successful user interaction. Usability refers to the extent to which a user can use a product within a specific context to achieve their goals effectively, efficiently, and satisfactorily [40, 41]. Usability is typically evaluated iteratively throughout the design process to ensure that the final product supports user needs and task completion in an optimal way.

Usability is important because it directly affects whether users are able to successfully interact with and continue using a system. In digital contexts users tend to leave quickly if an interface is confusing, difficult to navigate, or fails to communicate its purpose clearly. Improving usability has been shown to positively affect key performance metrics such as increased conversions, faster task completion, and reduced training costs [42]. In the context of this study, Fritscher and Pigneur [29] highlight that small and medium-sized enterprises (SMEs) often exhibit low digital maturity and limited technical awareness. This increases the importance of simplicity, clarity, and strong visual communication in digital tools. Consequently, the system developed in this study must prioritize usability to support users with varying levels of digital competence and ensure accessibility and ease of use in practice.

Usability is commonly described through several key dimensions. According to Nielsen [42], these include learnability, referring to how easily new users can accomplish basic tasks. As well as efficiency, describing how quickly tasks can be performed, and memorability, which concerns how easily users can regain proficiency after non-use. It also includes errors, referring to their frequency, severity, and recoverability. Lastly, satisfaction as dimension, describing overall comfort when interacting with the system. Related definitions further emphasize engagement and error tolerance as core aspects [40, 41].

To achieve high usability, designers must understand users' goals, contexts, and limitations, and design interfaces that are simple, consistent, and aligned with real-world conventions. Clear navigation, appropriate feedback mechanisms, and well-designed affordances are essential to reduce cognitive load and support intuitive interaction [40, 41]. Consistency across interface elements is also a key factor in usable de-

sign. Typography, color usage, spacing, and visual hierarchy influence how users interpret information, navigate the interface, and understand relationships between functions. Consistent visual structures reduce cognitive effort, improve learnability, and increase efficiency by enabling users to recognize patterns and predict system behavior [43, 44]. Established interface conventions, such as layout principles and standard interaction patterns, further support intuitive use and reduce ambiguity [45]. Furthermore, input elements should also align with their intended function and user expectations. For example, checkboxes are appropriate when multiple selections are allowed, as they clearly communicate non-exclusive choices [46]. Similarly, interface patterns such as carousels can be used to organize multiple content items within limited space, but must be applied carefully as they may reduce visibility and require additional user interaction.

Accessibility is closely related to usability and focuses on ensuring that digital systems can be used by as many people as possible, including individuals with disabilities. While usability concerns how effectively, efficiently, and satisfactorily users can achieve their goals, accessibility ensures that users with different visual, auditory, motor, or cognitive abilities are not excluded. Henry [47] defines internationally recognized accessibility standards based on the principles that content should be perceivable, operable, understandable, and robust. Integrating accessibility into usability work improves overall user experience and supports the development of inclusive digital solutions.

Translating analogue frameworks into digital tools requires more than replicating their visual structure. It involves rethinking how information is structured, how decision-making is supported, and how feedback is communicated to users with varying levels of digital experience. Fritscher and Pigneur [29] emphasize that this often requires iterative refinement, where sketches, prototypes, and conceptual models are progressively developed into interactive solutions that can be evaluated with users and stakeholders [33, 38]. In business-oriented contexts, this means structuring tools around users workflows rather than internal system logic, ensuring that each step is meaningful and produces actionable outcomes [30]. In contexts involving circular transition or other complex decision-making domains, this is particularly important, as tools must reduce rather than increase cognitive load and support users in navigating unfamiliar strategic trade-offs [48].

3.3 Interaction Design in Organizational Change

Building on the RtD approach, interaction design in this project is directed specifically at organizational change contexts, where designers create innovative artifacts to explore and frame complex, under-constrained problems [33]. Iterative prototyping and stakeholder engagement are used to explore how CBM frameworks can be operationalized in furniture SMEs. The artifact is thus not only a deliverable, but a means of investigating how interaction design can support implementation of circular strategies and what demands emerges from this context. In organizational contexts, the design of a tool does more than provide a functional interface, it mediates how practitioners understand, prioritize, and enact change [37].

For SMEs, the transition towards more circular business models can be challenging due to limited time, resources, and internal expertise. Existing support is often provided through workshops, frameworks, or static materials. Although valuable, such formats may be difficult to apply in everyday practice, and reliance on external facilitation means progress can stall between sessions.

By structuring information, and guiding users step by step, complex topics may become easier to understand and act upon with a digital tool - allowing practitioners to engage at their own pace without requiring continuous external support [29]. Research on software-based business model development tools confirms this potential, while also noting that no existing tool fully addresses the range of functions practitioners may need, pointing to an underexplored design space [30]. The user-centered approach in this project will then mean to regard the specific conditions and constraints of furniture SMEs navigating circular transition.

3.3.1 Digital Tools in Organizational Contexts

Digital tools have become increasingly central to organizational work, extending beyond simple documentation to actively support decision-making, planning, collaboration, and knowledge management [49]. In organizational contexts, such tools can act as decision support systems, planning instruments, and collaboration platforms that enable both synchronous and asynchronous work - allowing users to engage at their own pace rather than being constrained by scheduled workshops or external consultants [49].

In the context of business model development, these properties become especially relevant. The BMC, explained in Chapter 2.3.3, has significant limitations in its paper-based form where each canvas is a standalone representation, making it difficult to track change over time, and marking up revisions requires elements to be redrawn [29]. A software-based tool addresses this by formalizing changes as discrete operations, adding, removing, or modifying elements, and allowing users to visualize the transformation between model states simultaneously [29]. Research confirms that such tools have substantial potential beyond pen-and-paper methods, with a taxonomy identifying characteristic functions across eleven dimensions covering modeling, collaboration, and technical attributes [30]. Despite this, no existing tool provides all identified functions, indicating the space remains underdeveloped [30].

For SMEs specifically, digital tools carry additional significance. Given their commonly reported constraints in terms of limited staff capacity, financial resources, time, and in-house expertise, as well as difficulties accessing external support and translating circular economy principles into concrete action [3, 27, 48], SMEs may benefit from tools that embed guidance and structure directly into the interface. By shifting parts of the cognitive and administrative burden from human facilitation to the tool itself, such solutions can scaffold complex tasks into manageable steps and support practitioners in moving from abstract concepts to practical decisions.

3.4 Interaction Design in Circular Economy Contexts

Interaction design has increasingly been applied within circular economy (CE) contexts as a means of shaping user behavior, communicating product information, and supporting more sustainable practices, notable when reviewing the market to find several digital platforms similar to the examples below. Much of this work has focused on consumer-facing applications. Among these are platforms that facilitate reuse, repair, and redistribution of products. Examples include repair-support applications that guide users through maintenance procedures [50], marketplace platforms enabling peer-to-peer exchange of second-hand goods [51], and interfaces for product take-back schemes [52]. These tools demonstrate that interaction design can play a meaningful role in enabling circular behavior at the point of use.

A growing area of application is the design of interfaces for Digital Product Passports (DPPs), which under the EU’s Ecodesign for Sustainable Products Regulation (ESPR) will require products to carry accessible information about origin, repairability, and end-of-life options throughout their lifecycle [1]. Designing these interfaces involves balancing the informational needs of multiple stakeholders: consumers, manufacturers, and regulators, while keeping the interaction accessible and actionable [53]. For furniture SMEs specifically, this represents both a regulatory challenge and a design opportunity, as the sector has been identified as one of the prioritized product groups under ESPR and has generally not undergone the same degree of digital transformation as other manufacturing industries [48].

Beyond consumer tools and compliance interfaces, interaction design has also been explored as a means of supporting sustainability nudging, using design patterns to encourage more environmentally conscious decisions without restricting user choice [54]. Research in this area draws on behavioral theory to examine how framing, defaults, and feedback mechanisms within digital interfaces can shift behavior toward more circular outcomes.

However, while interaction design has been applied extensively in consumer-facing CE contexts, its use in strategic business support tools, particularly those targeting SMEs, remains limited [29]. Most existing digital tools in this space are either broad sustainability reporting platforms or general business model canvases that have not been specifically designed for the operational realities and resource constraints of SMEs [3]. This represents a notable gap, as SMEs face distinct challenges in circular transitions: limited digital maturity, scarce internal expertise, and a need for immediately actionable rather than conceptually oriented tools [48]. Addressing these constraints requires applying interaction design not only to the interface, but to the underlying logic of how information is structured and made meaningful for practitioners navigating organizational change.

4

Methodology

This chapter presents the methodology implemented in this project, stretching from process frameworks to specific methods of ideation and data collection. The study follows a *Research through Design (RtD)* approach [33], as described in Chapter 3, meaning that research questions and insights evolve iteratively as the artifact is developed and evaluated. To enable full understanding, the methods are explained in how they are executed and what their benefits and drawbacks are.

To follow how this methodology is used, it is complemented with the process description in Chapter 5 by describing the practical execution of these methods within the specific project context. This includes concrete activities, participants, iterations, and design outcomes. Together, the chapters establish both methodological rigor and empirical transparency. They enable reliability and could be repeated with similar outcome.

Regarding **ethical considerations** of the methodology, the study follows established ethical research principles throughout, including informed consent, voluntary participation, transparency regarding the study’s purpose, and the right to withdraw. These principles are applied across all user-centered methods, including interviews, usability tests, and questionnaires. Collected data is minimized to reduce the risk of personal identification, with audio recordings used where possible and video limited to screen recordings during usability testing. All data is stored securely and retained only for the duration of the project or until participants request its removal, in accordance with GDPR. It should also be noted that the study assumes basic digital literacy among participants, which may indirectly exclude individuals with limited experience of digital tools or with visual, cognitive, or mobility impairments.

4.1 Process Frameworks

Several established frameworks exist for structuring a design process. Nguyen [55] compares five of the most widely used: Design Thinking, the Double Diamond, Human-Centered Design (HCD), Design Sprints, and Lean UX. Design Thinking [55, 56] and HCD [55, 57] both center on deep user involvement and empathy-driven processes, making them well suited for open-ended, complex challenges. However, both require experienced facilitation and extended engagement to execute effectively. Design Sprints [55, 58] and Lean UX [55, 59] prioritize speed and minimal output, compressing the design process into rapid cycles suited for fast-moving, in-house

product teams where documentation is secondary to delivery. The Double Diamond, developed by Design Council [60], takes a different approach by explicitly separating the problem space from the solution space across four phases: Discover, Define, Develop, and Deliver. This provides a clear and communicable structure that supports iterative development across multiple cycles.

Since several stages of this project are presented to both stakeholders and readers of different backgrounds, it requires structure that supports clear documentation and communication. The demand for traceability in the argumentation of a Master's thesis reinforces this further. Design Thinking and HCD were considered, but both require deep facilitation and extended user involvement that exceeds the time constraints of this project. Design Sprints and Lean UX, while fast, prioritize speed and minimal output over the thorough documentation and iterative depth that a research project of this scope requires. The Double Diamond is therefore the most appropriate framework: it provides the explicit separation of problem and solution spaces needed for a traceable research process, supports iterative development across multiple cycles, and is well suited to contexts where the process must be communicated clearly to stakeholders with varying backgrounds. It will form the structural basis for the methods that follow.

4.2 Data Collection Methods for Discovering

The *discover* phase focuses on collecting data to build contextual, theoretical, and empirical understanding of the problem space and user group [60]. This can be done through several methods, where Wadsworth [61] presents many of their procedures with benefits and drawbacks of the results.

4.2.1 Literature Study

A structured literature study is used to establish the theoretical and contextual foundation of a project [61]. Literature reviews are considered a fundamental component of academic research, as they enable researchers to relate their work to existing knowledge and position their contribution within the research field [62]. According to Snyder [62], literature reviews can be conducted using different approaches depending on the purpose and scope of the research. These approaches include systematic for transparently synthesizing empirical evidence, semi-systematic appropriate for broader conceptual topics, and integrative reviews for critiquing and synthesizing literature [62]. In this study, a semi-systematic approach was applied, as the research area spans multiple interdisciplinary perspectives related to circularity, interaction design, and user-centered development.

To execute the literature study, relevant scientific articles, books, and online resources are identified through keyword-based searches in academic databases and search engines Wadsworth [61]. Search terms and source selection are guided by relevance to the study purpose and research questions. To ensure traceability and credibility, records of the collected literature and extracted findings should continuously be documented throughout the review process Wadsworth [61].

4.2.2 Market Analysis

To get a sense of what has been done at the market prior to the study, a market analysis can be executed [63]. This involves identifying and reviewing relevant tools, frameworks, reports, and artifacts that address similar challenges or aim for comparable outcomes. This provides an overview of how similar problems have been approached and what kinds of support already exist. It can further help highlight patterns across existing solutions, as well as identify gaps or limitations [63].

Similar to the literature study, the documentation of the market analysis is through keeping record of the findings. A compilation of the sources gathered together with their results for future reference and further research. This can be followed and viewed as a basis of where to draw inspiration from and where to place the deliverable on the market.

4.2.3 Interviews

To gain empirical insights, user studies can be conducted, such as using the methods of interviewing users [61]. They are used as a primary empirical method for understanding user contexts, challenges, and perceptions [61, 64]. Both group interviews and individual interviews can be conducted and both methods have many different structures to them. Regardless of structure, there are also several key factors to focus on when conducting the interviews.

Individual interviews focusing more on their own perception and experience [61, 65]. This is positive when wanting to gain deeper insights in different people in the target group, ensuring voices are not lost in the crowd as group interviews risk [65]. Group interviews demanding simpler and fewer questions but encouraging discussion which can generate rich qualitative data [61]. Using groups are most valuable when the goal is to generate new ideas or finding innovative solutions to the problem.

The structure of interview questions depends on the goals of the data collection. Wadsworth [61] describes three approaches. Primarily, *standardized questioning*, where identical questions are used across all participants to enable smooth comparison. Secondly, *iterative or emergent questioning*, where questions are refined between participants based on how useful they proved, allowing progressive understanding of the target group. Lastly, *strategic or whole-cycle questioning*, which asks not only how things are today but how they could be, and how participants feel about this. It grounds the research in observed practice rather than theory alone.

These structures can be combined with varying degrees of interview openness. Rogers et al. [35] and Alshenqeeti [64] describe three forms. There are *unstructured interviews*, which follow only a loose topic plan and rely on probing to generate rich qualitative data, though at the cost of comparability. Another structure is *structured interviews*, which use predetermined, largely closed questions suited to gathering comparable, quantitative-leaning data. Lastly, there are *semi-structured interviews*, which combine a guiding script with open questions and probing, balancing consistency across participants with flexibility for emergent insights.

4.2.4 Usability Testing

Usability testing is another form of user testing which are employed to evaluate the usability, clarity, and functional logic of design prototypes [66]. This method enables the assessment of task completion, interaction clarity, user comprehension and perceived usefulness. They are conducted by having participants perform realistic tasks with a UI and evaluating their behavior and experiences [67].

Importance lies in that the users are of realistic character in regards to the product being studied [67]. They should fit within the description of the target user group identified. There is also a method of doing usability tests on UX experts [68]. This contributes to a fresh perspective from an expert inspecting a system, possibly identifying missed usability issues. A combination of these participants can be useful for different insights and during different parts of the process.

Usability testing can be of both qualitative and quantitative nature [67]. When conducting qualitative usability tests, participants' interaction with the product are observed through realistic task scenarios and they focus more on collecting insights regarding how the participants use the product. A scenario provides a narrative context for the tasks, grounding the participant's actions in a believable situation that mirrors real use, which supports more natural and authentic interaction with the product. Quantitative usability tests instead focus on collecting metrics describing the users experience, such as time on task and task success. To enable identifying the participants behavior patterns through quantitative usability tests, their movements should somehow be recorded to be able to trace back [67]. One way to do this is to record the screen when a user interface is the product of the conducted tests.

4.3 Data Analysis Methods for Defining

With the resulted data from the discover stages, a compilation and analysis need to take place in the *define* stage to narrow down the information to what is important to focus on in upcoming stages [60]. This can be done through a number of analysis methods. To continue with design development from the analyzed data, it needs to be translated to requirements and guidelines and prioritized for continued work.

4.3.1 Thematic Analysis of Qualitative Data

Wadsworth [61] describes a way of analyzing qualitative data by finding patterns among it, making sure the data stays structured for systematic analysis. A way of finding patterns is through a thematic analysis, where the KJ-method, or an Affinity diagram, is one form of doing it. A thematic analysis is used to structure a large quantity of information by getting familiar with the data through reading and then writing down interesting extractions from transcripts of the collected data [69]. These extractions are then sorted into groups and subgroups. The groups are labeled matching their content, and refined until clear patterns show. The aim is to identify patterns, themes and meaning structures across empirical material. These problem areas help formulate problem statements and requirements for the tool.

This method enables the identification of patterns, themes, and meaning structures across empirical material and it supports systematic interpretation while allowing flexibility and contextual sensitivity.

By using the KJ-method, a thematic analysis is conducted in a visual matter, with the help of post-it notes or similar tools [70]. One example of a tool is Figma which has a function called FigJam where this is easily conducted with virtual post-its [71]. Doing it on an online note simplifies grouping and documentation for later review. This enables clear visual understanding of where problems are identified from the data and what to focus on in a hierarchical manner in continuation of the analysis [70]. Although it can be time-consuming, it ensures deep level of understanding the problems and clear organization of the analysis. It is a method highly used in UX design processes and in user research.

4.3.2 Analysis Methods of Quantitative Data

Quantitative data from the data collection can be analyzed by finding the mean, mode and the median of the results [72]. The mean is the sum of the quantitative data for one variable divided by the number of data entries. It gives the average of that particular variable. The mean by itself is sensitive to outliers and highly affected by deviating responses. To ensure representativeness, it can be complemented by the median of the data entries, which is the numerical middle of the responses. Being less sensitive to outliers, it provides a more accurate mid-point value of the data. In larger data collections, the mode can also be complementing the analysis, presenting the most frequently appearing response. The combination of these shows how skewed the underlying distribution is for the particular variable.

In usability tests, the metrical data extracted such as time och clicks per tasks by the participant can be analyzed through the above mentioned methods [67]. It can also be analyzed through a comparison of an optimal entry. This can give intel of where there are issues in the interface. Depending on how it is measured or how the tests are executed, it could need combination of the qualitative data if sometimes deviating time or clicks is because of other reasons than the interface itself.

4.3.3 Requirements and Guidelines

Findings from the analysis can be translated into requirements and guidelines, forming a structured bridge between empirical insight and design development and supporting traceability between user data and design decisions [35, 73]. Requirements represent verifiable criteria setting the frames for the development, while guidelines function as directional design principles steering the development in the right direction [73]. This differentiation enables clear continuation from data into the development phase.

According to the ACD3 method by Bligård [73], requirements and guidelines can be differentiated further into types of requirements or types of guidelines. They then have different design levels of what their effect will regard in the system at hand. There are e.g. functional requirements affecting the architecture of the sys-

tem or artifact or design guidelines affecting the more architecture's aesthetic. When extracting requirements and guidelines, they are listed in tables including their description, their effect, their design level and their source. This can be combined with other variables as well. This structure enables clear following from source of data to requirement.

4.3.4 Prioritisation through MoSCoW

Where many stakeholders are involved or when the project is of larger scale, it is not uncommon that the list of requirements and guidelines becomes of larger size. This can be difficult to work with, both depending on the time frame available as well as other limiting resources in a project. To help structure which requirements and guidelines to focus on, a prioritization method is needed.

Several prioritization methods exist for structuring requirements and design decisions, where Gibbons [74] presents some. One of them is the MoSCoW method, which clusters requirements into 'Must have's', 'Should have's', 'Could have's', and 'Won't have's' (sometimes also called Wish), offering a simplified approach within a constrained time frame [74]. 'Must have' requirements are essential for the system to function, 'Should have' requirements add significant value but are not critical, 'Could have' requirements are desirable but optional, and 'Won't have' requirements are explicitly excluded in the current project scope. As this project operates under a clear time constraint and is neither highly collaborative, technically oriented, nor set within an organization with predefined goals, the MoSCoW method is the most applicable.

An important benefit of MoSCoW is that it offers a structured approach for discussions among stakeholders, making priorities and decisions easier to evaluate. One limitation is that subjective judgments can affect categorization, especially when multiple stakeholders have different priorities. Including "Won't have" items is particularly useful when resources or time are limited, as it clearly marks which requirements are postponed or excluded, preventing the project scope from becoming too broad or misaligned, and helping the team focus on what is truly essential.

4.4 Ideation for Developing

The *develop* phase focuses on ideation and concept generation based on the defined requirements and guidelines [60]. There are several ways of performing ideation to enable the most use of the groups creativity. Wikberg-Nilsson et al. [34] describes a number of them in their book on design processes and methods. To generate numerous ideas quickly, *brainstorming* and *braindrawing* are methods that can be used.

4.4.1 Brainstorming

Brainstorming is a creative method that aims to solve problems or generate new and innovative ideas by generating a large number of ideas. The method was originally introduced by Osborn [75], who emphasized the importance of deferring judgment and encouraging free thinking to increase idea generation. There are many different approaches to brainstorming. In design contexts, brainstorming is often used in early stages of a project to explore a wide range of possibilities and perspectives. Despite variations, brainstorming generally emphasizes quantity over quality in the initial phase, allowing ideas to be refined later.

In practice, a brainstorming session usually starts with a clear problem statement, followed by a time-limited period where participants freely share ideas, either verbally or in writing [34]. Participants are encouraged to hold back criticism, build on each other's ideas, and focus on generating as many ideas as possible. During the session it is crucial to document the ideas to enable further building upon. This can be done by writing and on openly available surfaces for all participants to contribute. After each session, the ideas are discussed and refined for further development.

4.4.2 Braindrawing

Braindrawing is a variation of brainstorming where ideas are generated through sketching ideas and designs, rather than verbal discussion [34, 76]. The method is focused on fast sketching of many different ideas and allows participants to visually express concepts and build on the ideas of each other by iterating on sketches [76]. Ideas can later be selected and developed further. Braindrawing supports collaborative idea generation while reducing the influence of dominant voices, as all participants contribute simultaneously. It is highly beneficial in designing since it limits the constraints of verbally communicating visual ideas.

According to Wikberg-Nilsson et al. [34], braindrawing is initiated by defining the themes of what the generated ideas should regard. All participants individually sketch their ideas during a restricted amount of time, around five minutes, before switching paper to build on the others ideas. When all ideas are drawn and the time limit is up, the ideas discussed, categorized and documented. Sketching instead of writing, as in brainwriting, enables new perspectives and perhaps more creative ideas [34, 76].

4.5 Prototyping Methods for Delivering

The deliver stage of the double diamond narrows down the potential solutions to the ones that work and should be the result of the iteration [60]. Therefore, when concepts are developed, they need to be evaluated to ensure they fulfill the requirements and guidelines identified. This can be done using a *Pugh matrix* [34]. When evaluated, the resulting concepts can then be prototyped through low- or high-fidelity prototypes to be tested for further understanding.

4.5.1 Evaluation of Concepts through Pugh-matrix

To ensure the developed solutions or concepts fulfill the generated requirements and guidelines, they need to be evaluated. Doing this before further development of the concepts saves time and effort. There are several ways of executing an evaluation and they can be modified to fit the scope or time frame at hand. One example of evaluation methods is a Pugh-matrix where each concept is compared to each requirement with a weighted score [34, 77]. This results in concepts being compared to each other through different criteria from the requirements and guidelines, and weighted points. The top contenders are continued with in the development process.

4.5.2 Low-Fidelity Prototyping

The final part of the deliver stage involves prototyping the selected concept for further development, typically initiated with low-fidelity (lo-fi) representations, such as *wireframes*. What fidelity the prototype entails refers to to what degree it represents the look-and-feel of the final system., varying in the areas of visuals, interactivity, and content and commands. Once validated, the lo-fi prototypes are developed into high-fidelity (hi-fi) prototypes, which present the complete design concept and allow evaluation of detailed interactions [39].

Lo-fi prototypes are intended to represent specific functions, ideas, or interface elements for early testing and further development [38]. At this stage, it is not necessary for the prototype to be fully functional or to reflect the final vision of the product. Instead, the purpose is to communicate core concepts quickly and clearly. It is important that the prototype signals its unfinished nature through its presentation, as this encourages relevant and constructive feedback rather than comments focused on minor details. Lo-fi prototypes enable visualization of structure, functionality, navigation flow, and layout with minimal effort, while also supporting exploration of interaction logic and overall system architecture [38]. Their simplicity makes them particularly suitable for rapid iteration, brainstorming, and early validation with users or stakeholders.

There are several ways to create lo-fi prototypes for web applications, ranging from pen-and-paper sketches to digital wireframes [38]. Wireframes are a common medium because they illustrate the structure and flow of the application through basic hierarchy and organization. They are typically produced without final color palettes, typography, or detailed graphical elements in order to focus attention on high-level design concepts. This makes them efficient to produce during the early stages of development without excessive time investment. Digital tools such as Figma can be used for this purpose, where the FigJam feature supports quick ideation and wireframing [71]. Figma is a non-programming user interface design tool that supports the creation of several design artifacts, including wireframes and mock-ups [78].

4.5.3 High-Fidelity Prototyping

In contrast, high-fidelity (hi-fi) prototypes represent the final product, or something close to it, in terms of appearance and behavior [38]. These prototypes are often more interactive and visually refined, allowing realistic testing of usability, interaction quality, navigation logic, and overall system coherence. Because they resemble the intended final product, they can generate more precise feedback regarding user experience, aesthetics, and functionality. Hi-fi prototypes are therefore valuable during later development stages when design decisions need to be validated before implementation.

Similar to lo-fi prototyping, hi-fi prototypes can be created using several methods and tools. For interactive web applications, design tools such as Figma make it possible to connect screens, simulate user flows, and create clickable interfaces without requiring programming [78]. At this stage, greater emphasis is placed on colors, typography, spacing, imagery, branding, and micro-interactions so that the prototype closely reflects the intended final design. In this way, hi-fi prototypes serve as an important bridge between conceptual design and technical implementation.

4.6 Methodological Reliability and Limitations

The reliability of the study is supported through triangulation of methods [79], combining qualitative and quantitative data collection across multiple phases. Iterative validation with users throughout the process further strengthens reliability by grounding results in their intended use and environment. Systematic documentation ensures that decisions are traceable and based on recorded data rather than subjective judgment, and that analysis goals are clearly defined before each phase.

The iterative and exploratory nature of the process also introduces limitations. Non-linear design cycles rely on interpretation and decision-making[35], which can introduce subjectivity and make traceability between problem framing, findings, and design decisions challenging. The systematic documentation practices described above aim to mitigate this. The flexibility of iterative processes also increases the risk of scope drift as new insights emerge. The use of RtD further situates the produced knowledge in the specific context of this project, limiting generalizability. Artifacts also risk being perceived as final outcomes rather than vehicles for inquiry, placing responsibility on the researcher to articulate clearly how insights emerged through the design process.

Sampling limitations affect the empirical methods throughout. The restricted number of participants limits the representativeness of findings and reduces the possibility of identifying broader patterns. Interview data is sensitive to moderator influence and participant interpretation. Usability tests capture task-based behavior that may not fully reflect real-world use. Thematic analysis through the KJ-method is highly interpretative, though this risk was managed through collaborative analysis with continuous questioning and discussion of the data. Quantitative analysis of small datasets limits the reliability of indicators such as mean and median, particu-

larly where distributions are skewed. Together, these factors mean that conclusions should be understood as grounded, practice-based insights rather than generalizable empirical claims.

5

Process

This chapter presents how the process of the project was executed to reach its outcome, including the use of methods, relevant findings and prototypes along the way. The resulting findings and final prototype presented in Chapter 6. The nature of the project laid as a basis for deciding between the different process frameworks available. Considering aspects such as clear documentation for communication, and structure to follow, the *Double Diamond* was the framework chosen to follow, explained more explicitly in Chapter 4.1, but through a modified and iterated version. A model popularized by Design Council [60], consisting of the phases *discover*, *define*, *develop*, and *deliver*. The process is applied with an iterative structure with multiple feedback loops, adapted to fit the nature of the project.

Rather than a linear process, the methodology is structured as interconnected phases, allowing continuous re-framing of both problem and solution, as visualized through a modified process model, designed for this project, in Figure 5.1. This iterative structure supports progressive refinement of the problem definition, continuous validation of design assumptions, integration of empirical insights throughout development through both qualitative and partially quantitative methods, and iterative evaluation and improvement of design concepts. The model functions as a methodological scaffold rather than a rigid procedure, enabling flexibility and responsiveness to emerging insights during the research process.

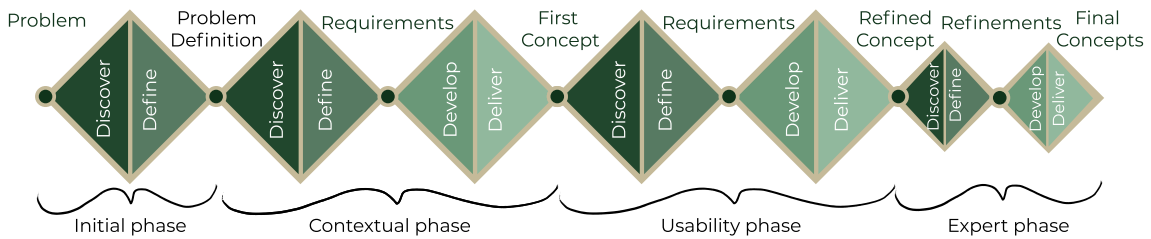


Figure 5.1: Modified iterative process model inspired by the double diamond

Concretely, the project was structured as a series of four interconnected phases, as seen in Figure 5.1. The process consisted of an *Initial* phase of *Discover-Define* based on literature studies and contextual analysis, resulting in a clear problem statement. Following was a second *Contextual* phase of a *Discover-Define* diamond and a *Develop-Deliver* diamond, where the *Discover-Define* diamond is based on

user studies and empirical data and the *Develop-Deliver* diamond is for concept generation and refinement resulting in prototypes. The third *Usability* phase consisted of a *Discover-Define* and *Develop-Deliver* diamond for usability testing and evaluation, resulting in a refined prototype. Lastly, a smaller *Expert phase* was conducted through a *Discover-Define* and *Develop-Deliver* diamond enabling final validation and refinements into the final prototype.

5.1 Initial Phase

The first phase of following the Double Diamond structure consisted of a *Discover-Define* phase. The discovering consisted of a founding *literature study* and the defining meant to *analyze* the findings together with the scope to ensure full understanding of the problem and its context. The result from this was the problem definition to base the next phase of the project on.

5.1.1 Discover through Literature Study

To understand the problem and the scope, a literature study was conducted. It focused on building contextual, theoretical understanding of the problem space and user group. Besides this, the literature study also served as a basis of where the study should be positioned. This, by identifying existing knowledge, conceptual frameworks and research gaps relevant to the project. Its result also informed several requirements and guidelines in the later analysis within the first phase.

To ensure the results would generate profitable data, it was necessary to first define the reviews purpose: understand the context of the project and finding what had already been discovered in the area of its research that could be built upon. A relevant database then needed to be established, where the abstracts of the papers were screened to ensure relevance. The relevant papers were read and the findings were then presented in a productive manner. It was summarized in a collective document, with comments made of where these insights could be useful in the project's work. The database for the papers were initially provided in a shared folder by the research projects CirkuTrä and RE:Furn: previously conducted research leading up to this project. They regarded research on CE, circular strategies, CBMs, remanufacturing, the Swedish furniture industry, and previous work related to the RE:Furn and CirkuTrä projects.

Since this project regards digital tools, which is not considered in the previous work of CirkuTrä and RE:Furn, another search was made on Google Scholar with digital tool in business model which generated several papers relevant for this project. They regarded challenges for digital tools in business model innovations, e.g. how the business model tool by Osterwalder and Pigneur [16] can be modified to best support a transition in business models and the development of a tool supporting decisions when analyzing business models.

Besides insight on the related work in the project's area, the literature study also included existing tools with similar purposes. This finding gave a base for a market analysis to identify what similar tools or frameworks are used and how the users experience them. From this market analysis, it could be identified both needs and requirements from the users, as well as inspiration for the future development of the tool for this study.

5.1.2 Define through Problem Refinement

The information gained from the literature study was discussed internally to ensure mutual understanding of the project and the identified problem related to the initial scope. In discussion with the supervisor from both the university as well as from CirkuTrä and RE:Furn, the problem statement was narrowed down and research problem was defined. This was done by reviewing the previous work done of the subject to identify where the gap existed and needed to be filled.

The research questions for the research problem developed with the project and was refined when more information and understanding of the project and problem was gained. Refinement was executed in discussion with the supervisor and examiner to ensure the research questions were relevant, answerable and reasonable within the project's limits.

5.2 Contextual Phase

When understanding the scope and problem definition, the second phase of the project could be initiated with a new Double Diamond where the contextual understanding of the potential users was gathered and implemented into the prototype. This included conducting *interviews* with potential users, *analyzing* the generated data into needs and requirements, *ideating* possible solutions fulfilling these and lastly resulting in *prototypes* for further testing.

5.2.1 Discover through Interviews

To initiate the second phase, user studies in the form of interviews were conducted to establish empirical understanding of the context and the identified user group. Initially, participants within the potential user group needed to be identified and contacted for involvement. Secondly, the form of interviews needed to be decided upon and developed. Lastly, the interviews were conducted with the participants.

When conducting user studies, the **choice of participants** is crucial to ensure valuable results. They need to be a fair representation of the intended users of the product, in this case, furniture SMEs. A list of involved companies and individuals was provided by CirkuTrä and RE:Furn, and acted as a start for the choice of participants for the user studies. Besides these companies, to get the perspective of companies not already aware of the previous projects and possibly not as far into the mindset of circularity, more furniture manufacturers were looked into. One bigger company was contacted in the hopes of understanding how they work with circularity

in a successful way possibly adaptable for SMEs. These companies were contacted because its connection to CirkuTrä and RE:Furn. From the initiated contact, seven were able to participate in the interviews. These participants are presented in Table 5.1, the participant's role, what kind of company they are, the company's focus and whether or not they have implemented circular business models.

Table 5.1: Overview of study participants

#	Participant's role	Type of company	Company focus	Circular maturity
P1	Sustainability Manager	Furniture manufacturer SME	Public & office interiors	Medium - active reuse & circular design initiatives
P2	Sustainability Co-ordinator	Furniture manufacturer SME	Custom public interiors	Low-Medium - project-based refurbishment
P3	Sales and Assortment Development	Furniture manufacturer SME	Solid wood, longevity-driven design	Medium - durability & repair orientation
P4	Head of Design and Sustainability	Furniture manufacturer SME	High-end officesolutions	Medium - durability & reuse potential
P5	Sustainability Co-ordinator	Large furniture manufacturer	Full interior solutions	High - take-back, refurbishment & system-level initiatives
P6	Project Leader	Industry network	Sector collaboration & innovation	System-level facilitator (not product-implementing)
P7	CEO	Industry network	Sector collaboration & innovation	System-level facilitator (not product-implementing)

The **form of interview** used is another important aspect of the study. Since none of the participants were based in the proximity of the project's conducting, neither in the proximity of the other participants, the interviews were conducted digitally through a video call. This ensured all participants had similar conditions when receiving the questions. The interviews were *individual interviews* of a combination of *iterative or emerging* questions and *strategic or 'whole-cycle'* questions in a *semi-structured* form, as described in Chapter 4.2.3. The objective of the interviews was to learn about the users workflows and to get their views and ideas regarding the handling of a new business model and CE. With this in mind, the interviews were designed to regard six different areas.

Initially, the participants were asked to describe their *role in the company* and how it is related to circular work, this to place the participant and understand which perspective they contribute with. They were then asked about how their company *works with circularity today*, whether or not they have an existing CBM or why they

do not and if it is their central business model or secondary. This, to understand what they already do and to be able to modify the upcoming questions accordingly. The third area asked about was the *transition from a linear to circular way of working*, how they either had experienced it or imagine it would look like in their respective company. From this they were also asked which steps they identified as the most important in this transition.

The fourth area was regarding *barriers and challenges* in the practicality of implementing a CBM or a new business model in general. This area included a question regarding the most limiting resources for SMEs. The fifth area moved from circularity and business models to *tools and support*. It regarded what tools the companies use today, in their workflow in general or when working with business models. If they had been provided with CirkuTrä and RE:Furn's material in previous research, they were asked how this had helped them or not. They were also asked *what kind of support they were missing today* for taking the next step towards circularity, which transitioned the interview into the sixth and final area, the need of a tool. This area regarded how a tool could help them, what functions would be valuable and what would make it easy to work with practically.

When participants and form of interviews are decided upon, the **conducting of the interviews** is the next step. The plan for the interview was presented shortly to ensure they felt comfortable with how they should respond and handle the interview. Lastly, they were asked for permission to record their voice for further analysis, which they all agreed to and signed a digitally sent contract stating the purpose of the data collection and that it would be deleted upon request. The six areas presented above were then discussed in a semi-structured way with written questions as the base, available in Appendix M. The voice recordings were made with a computer as well as a smartphone to enable security if one was unsuccessful.

The interview with P1 was conducted with an initial set of questions regarding the six areas mentioned above, available in Appendix L. After this, some questions were identified as ineffective and were modified to a new version more adapted to the companies at hand, available in Appendix M. This second set of questions were used in the interviews with P2 to P5. P6 and P7 were in a group interview and was not a manufacturing company but rather works as a network for manufacturers. For this reasons, the structure and questions for this interview were modified to ensure relevant insight gained, the script used for this is presented in Appendix N but worked as a support more than strictly followed. This, since the group interview was more of an *unstructured interview* and discussion where they had the possibility of giving their perspective from the bigger picture rather than individual companies. They were instead asked broader questions of what steps are most important to successfully move from a linear to circular way of working, what kind of support they can identify as missing today, what a digital tool could help with and what systems this tool should be adapted to.

5.2.2 Define through Thematic Analysis

With the resulted data from the discover stages, a compilation and analysis needed to take place to narrow down the information to what was important to focus on in upcoming stages [60]. The qualitative data was analyzed through a *thematic analysis* to identify groups within the data to discover requirements and guidelines from the users. As written in Chapter 4.3, this is done by first becoming familiar with the data. The relevant parts are then labeled such as interesting extractions from the transcriptions. These labels are then grouped into themes which are reviewed when done to ensure still matching their content. When these themes have been defined and named, the report from this analysis can be produced to explain its outcomes. An overview of this structure is shown in Figure 5.2 where the data is extracted, grouped and named. The resulted categories from the interviews are presented and discussed further in Chapter 6.1, and are all available in Appendix A.



Figure 5.2: Overview of the structure of how the KJ analysis went from entered expressions grouped by participant in the left image, to identified categories in the middle image to lastly, refined categories and subcategories in the right picture

Initially, the data needed to be compiled. This was done by transcribing the data from the recordings made during the interviews by using AI tools such as the smart-phone and web application Klang.ai which listens to the recordings and spells it out from the identified speakers [80]. To ensure accuracy, the recordings were listened to while following the AI generated transcription to correct wherever errors occurred.

When the interviews had been transcribed, they were searched for weighted or otherwise relevant expressions. These expressions were copied to a board of sticky notes for a thematic analysis following the *KJ method*, as the example shown in Figure 5.2. This was done digitally using Figma's extension FigJam. Each participant was assigned a different color, for later understanding if a grouping of expressions were from several perspectives or only from one, which could make it less reliable. Each expression had their separate note. Through iterative grouping and refinement, thematic structures were formed. They represent shared challenges, needs, constraints, and expectations related to circular business model transition and tool support. These themes were translated into requirements and guidelines.

Requirements and guidelines were hierarchically structured from overarching system-level needs to more specific functional and interaction-level requirements. To support the transition into the development stage, the resulting set was categorized into *Design*, *Information*, *Function*, and *Smaller functions*, enabling a structured translation from analytical findings to concept development and interaction design

decisions. An example showing this layout is presented in Figure 5.3 This analytical structure ensured that the emerging design concept was directly grounded in user needs, empirical evidence, and theoretical frameworks, providing a systematic foundation for the subsequent development of the interactive tool.

I D		Description	Cause/effect	Category	Source	Prioritization
1	R	Be a digital tool	Enable digital use	Design	CirkuTrä/ReFurn Scope & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.	Must have
1,1	R	Include industry 4.0 infrastructure	Enable practical use	Design	Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin	Won't have
1,2	G	High usability	Ease use for real-world application	Design	Lit. study/Visualizing Business Model Evolution with the Business Model Canvas	Must have
1,4	R	Enable asynchronous use	Ease use for real-world application in real-time	Smaller function	Lit. study/Software tools for business model innovation: current state and future challenges	Could have
1,5	R	Enable role-specific UX/UI for internal stakeholders	Tailor experience for designers, manufacturers, suppliers	Smaller function	Lit. study/TMF, 2020	Won't have
2	R	Base development process on four steps framework from CirkuTrä	Enable applicable results	Function	CirkuTrä/ReFurn Scope	Must have

Figure 5.3: Example showing the layout of requirements and guidelines, where category and prioritization is chosen from a list and definition, cause/effect and prioritization is filled out. The full list is available in Appendix K

To structure **prioritization and decision-making**, a *MoSCoW* analysis was applied to the identified themes, integrating both empirical data from the interviews and theoretical insights from the literature study. How this was used is shown in the example in Figure 5.3. This enabled a clear distinction between essential, supportive, optional, and excluded system requirements. The analysis was further expanded using an adapted *ACD*³-inspired structure, where each requirement and guideline was linked to an identification number, source of information, and an explicit cause-effect relationship describing its intended impact if implemented. This created traceability between empirical data, theoretical grounding, and design decisions.

5.2.3 Develop through Braindrawing

Following the formulation of requirements and guidelines, the development phase was initiated through a structured ideation process. The aim of this phase was to translate the identified needs into potential design solutions and to explore alternative ways of structuring the digital tool. Initially, all requirements classified as 'Must have' and 'Should have' in the *MoSCoW* analysis were systematically reviewed and translated into functional elements. Based on this, an overview of necessary interface frames and their corresponding functions was established. Frames with similar structures and functionalities were grouped to enable reuse and ensure consistency throughout the tool.

The early ideation process focused on exploring different configurations of these functions within the interface. This was conducted using *braindrawing*, where multiple layout alternatives were generated under time constraints of 7-10 minutes depending on complexity of the layout. The purpose was to prioritize quantity over quality, challenge initial assumptions, and encourage divergent thinking. The generated ideas, examples shown in Figure 5.4, were subsequently discussed and evaluated to identify promising directions for further development. All drawings from this session are available in Appendix C.

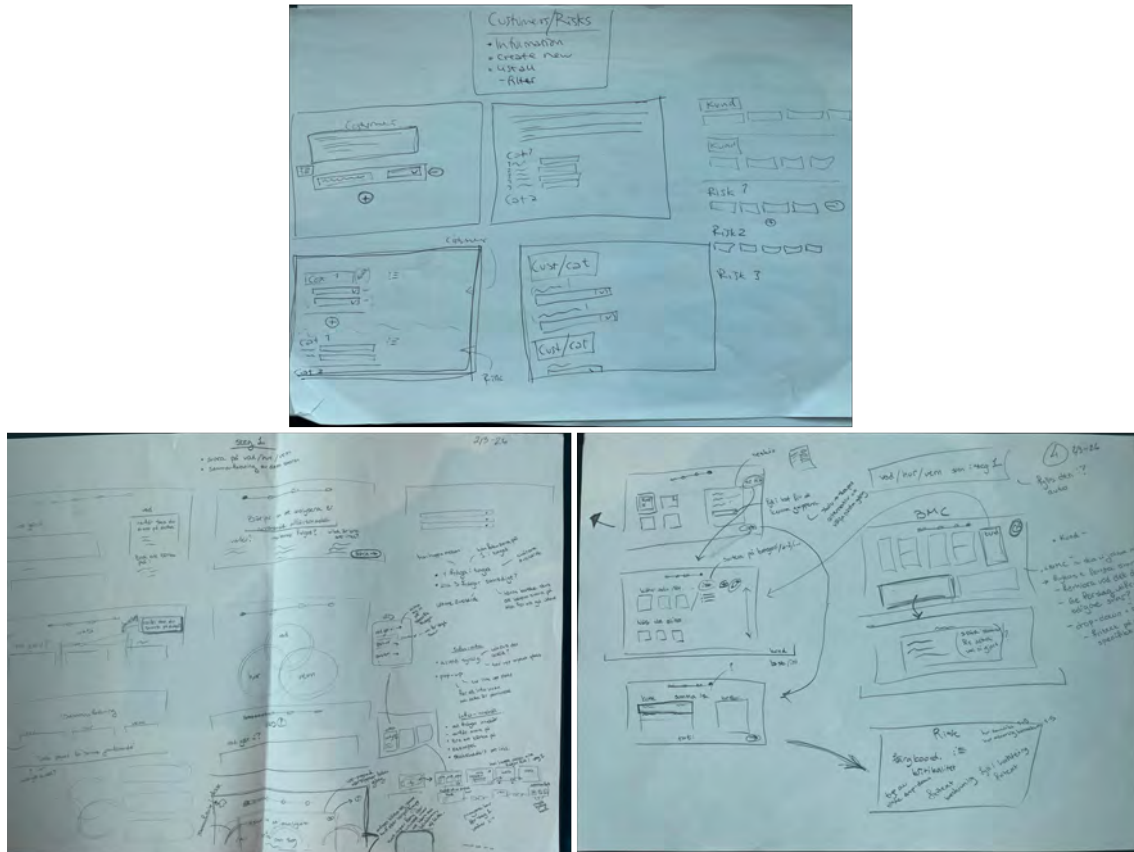


Figure 5.4: Example showing drawings from different stages of the braindrawing session. All drawings are available in Appendices C and D

When the ideas for the functions and flows were generated, the layout and design of the frames were still missing. To develop these, a second iteration of braindrawing was conducted, which are available in Appendix D. Focus now lay on keeping the functions and generating ideas on how they could look and be placed on frames for best usability. Since the tool consisted of four clear steps, based on the framework from the scope, a progress bar was discussed to include and its design ideated. High-level design was like this were ideated, and other broader layouts for the flow. Later, more low-level design was ideated, regarding each frame and where the functions and layout needed to vary. Keeping in mind to stay consistent within similar functions.

An evaluation took place of the generated ideas to understand which fulfilled the requirements and guidelines at hand. Because of time constraints, a full *Pugh-matrix* was not conducted, where all requirements available are compared to the

resulted solutions in a structured matrix. Instead, an evaluation took place inspired by the Pugh-matrix, where each resulted idea was compared to the list of 'Must have' and 'Should have' requirements and guidelines to understand which it fulfilled. This resulted in a gap analysis, clearly showing which requirements and guidelines were unfilled and could directly be addressed through additional ideation in the form of mindmapping or brainstorming. This is presented in Appendix P, where resulted ideas are followed by which requirements they fulfill and unmet requirements were explicitly identified and followed by proposed solutions. This enabled ruling out unfulfilling ideas and continuing with ideas aligning with the requirements and guidelines. As a result, the mindmapping process not only generated new ideas, but also ensured that the final concept covered the defined 'Must Have' and 'Should Have' requirements. This ensured traceability from requirements, through ideation, to the final prototype structure.

5.2.4 Design Decisions from Mindmapping

A dominant need expressed by the participants was for a clearly structured process, preferably divided into steps, which aligned closely with CirkuTrä and RE:Furn's framework in Chapter 2.3.4. Several ideas revolved around guiding the user through a predefined flow, including step overview on a start page, navigation between steps, and progress indicators, both global and per step. These ideas directly reflect requirements such as Guideline 18: *Make process of CBM development easily followed* and its subrequirement 18.2: *Show progression in development of CBM*, and Requirement 2: *Base development process on four steps framework from CirkuTrä*.

Many ideas focused on giving users continuous feedback on what they had done and what remained. Examples include automatic saving of inputs, visual summaries of each step, clear outputs from each stage, and overview of completed vs incomplete inputs. This supports e.g. Requirement 17.2: *Show progression status in transition to new CBM after development* and Requirement 9.1: *Include visual change feedback*. Another strong theme was the inclusion of guidance elements to support understanding. Some of the ideas generated were to include info boxes explaining questions, examples and suggestions regarding CBMs and the steps, information on which stakeholders to involve and explanation of why a question is relevant to motivate its use. This directly reflects requirements such as Requirement 6: *Offer guidance in the process of developing a new CBM* and Requirement 3.2: *Include transparent and clear explanations*, and Guideline 3: *Ensure feeling of trust*.

Several ideas explored how the tool could actively support decision-making. The resulting ideas included enabling users to receive recommended strategies based on previous inputs, showing percentage-based matching of strategies, allowing comparison between strategies, and including visualization of alternatives. This supports requirements such as Requirement 2.24: *Present alternatives of circular strategies*, while also aligning with Guideline 35: *Offer something the company cannot do without it*.

Ideas also focused on making CBMs actionable through including activities linked to chosen strategy, assignment of responsibility, logistics and return flows, and con-

nection to the BMC. These reflect several subrequirements of Requirement 2: *Base development process on four steps framework from Cirkuträ* from the scope as well as Requirement 5: *Enable understanding of the practical work of the new business model* and its subrequirements 5.3: *Inform of needed logistics* and 5.4: *Inform of needed manpower*.

These functions derived from the braindrawing session showed that most ideas converged around a process-oriented, guided tool combining structure, feedback, and decision support. This led to the selection of a concept based on a stepwise digital tool that guides SMEs through the development of circular business models, while providing continuous feedback, recommendations, and practical implementation support.

Building upon these identified themes, and the identified gaps in requirement fulfillment, the ideas were further refined into concrete design proposals through the second iteration of braindrawing. These proposals aimed to translate abstract concept directions into tangible interface elements and interaction patterns. The new focus was on detailed layout, navigation, and user interaction. These design proposals are presented in Appendix P and examples are illustrated in the previous Figure 5.4. The purpose of this step was to bridge the gap between ideation and prototyping by defining how the identified needs could be implemented in practice. When conducting the ideation session, there were a few elements and functions to keep in mind from an interaction design and UX perspective, as discussed in Chapter 3.2.1, such as clear navigation, feedback mechanisms, or when to use carousels and dialogue boxes.

The design proposals were not treated as isolated concepts, but rather as direct inputs to the development of the low-fidelity prototype. Several key elements were carried forward and implemented. This includes a step-based interface with a clear start page overview, showing all steps and progression. It also focuses on the use of progress bars at both overall and step-specific levels and integration of information boxes providing guidance, explanations, and examples. Furthermore, it contains a summary views at the end of each step, showing user inputs and outcomes, and a structure allowing navigation between steps without losing progress. These elements can be traced directly to the braindrawing outputs in Appendix C and D, where they were initially explored visually. The resulting design proposals functioned as a direct blueprint for the lo-fi prototype, where the defined structure, features, and interactions were implemented without major reinterpretation. This reduced the gap between ideation and implementation and ensured that the prototype remained directly grounded in the identified user needs, KJ categories, and requirements.

5.2.5 Deliver through Prototyping

Based on these insights and the resulting ideas, a low-fidelity (lo-fi) prototype was created in Figma with the flat structure lacking design elements. It consisted of wireframes representing the structure, functionality, and overall workflow of the tool, using placeholders rather than detailed visual design. The workflow and structure were informed by both the identified user requirements and relevant principles

and constraints derived from the literature study interviews forming the basis for subsequent evaluation and refinement. The lo-fi prototype was developed by combining what had been ideated on paper and the documented decisions from the braindrawing into a clear visual design in Figma. Layouts which had similar functions were designed identically for consistency. The purpose of the lo-fi prototype was to define the overall architecture and interaction logic of the tool, focusing on navigation, step progression, and interaction logic rather than visual design. The aim was then to evaluate the concept in its intended digital format rather than as paper representations. From this, a more accurate sense could be gained of how the design would look on a web application and adjust where needed before too much time and effort had gone into it.

The lo-fi prototype then served as the foundation for the development of a high-fidelity (hi-fi) prototype. Design theory was reviewed when initiating this phase, informing decisions regarding fonts, color palette, placements, and appropriate use of interface functions, as mentioned in Chapter 3.2.1. The process was iterative, with continuous refinements made to both layout and functionality. To support scalability and consistency, reusable components and frame templates were implemented, allowing global adjustments of design elements such as dimensions, spacing, and color. Visual attributes such as color schemes and border radii were defined to enhance usability and coherence, with color accessibility validated against WCAG standards using WebAIM [81]. Additionally, interactive elements were implemented within the prototype to simulate navigation and key user interactions within the tool. The resulting lo-fi and hi-fi prototypes are described in the sections below.

5.2.6 Low-Fidelity Prototype

The lo-fi prototype was structured according to the four-step framework from Cirkuträ presented in Chapter 2.3.4, ensuring alignment with Requirement 2: *Base development process on four steps framework from Cirkuträ* and its subrequirements. Each step was developed to include user inputs, supporting guidance, decision points, and generated outputs. This resulted in a coherent flow where the user is guided through the development of a circular business model in a sequential yet flexible manner. The frames from this prototype are all available in Appendix E. The requirements and guidelines in this section are referred to as they are presented in Appendix B.

The home page introduces the overall process structure, including progression overview, motivational and learning content, and inspirational examples in a carousel. This reflects Requirement 18: *Make process of CBM development easily followed*, Requirement 33: *Help increase knowledge of circularity within the company*, and Requirement 25: *Get examples and inspiration of others' transitions*. This layout is presented in Figure 5.5.

When starting the process, the prototype includes step-specific pages where users enter company data and make decisions. These differ depending on what the task is, but the overall layout stays the same. It initiates with an overview page as seen in Figure 5.6 where each task within the step is visible and reachable together with a

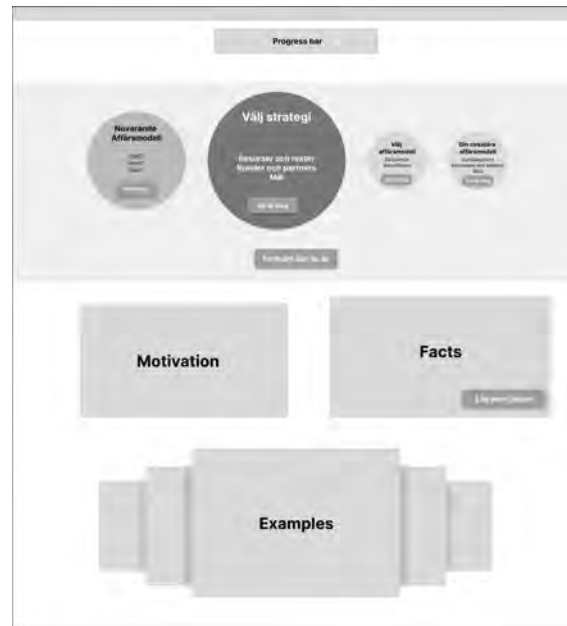


Figure 5.5: Home page in its extended form in the low-fidelity prototype

summary of what data is already entered or decided upon. This structure supports Requirement 3.2: *Include transparent and clear explanations*, as users can clearly see their progress, previous inputs, and what they can do next. When the user reaches an overview for the first time, an information box is popped up in the middle of the screen, informing the user of the step. This supports Guideline 1.3: *Support low digital maturity* with a clear explanation of the step. Each step is then finalized with a summary presenting the output of what has been entered and decided, and what this information will lead to.

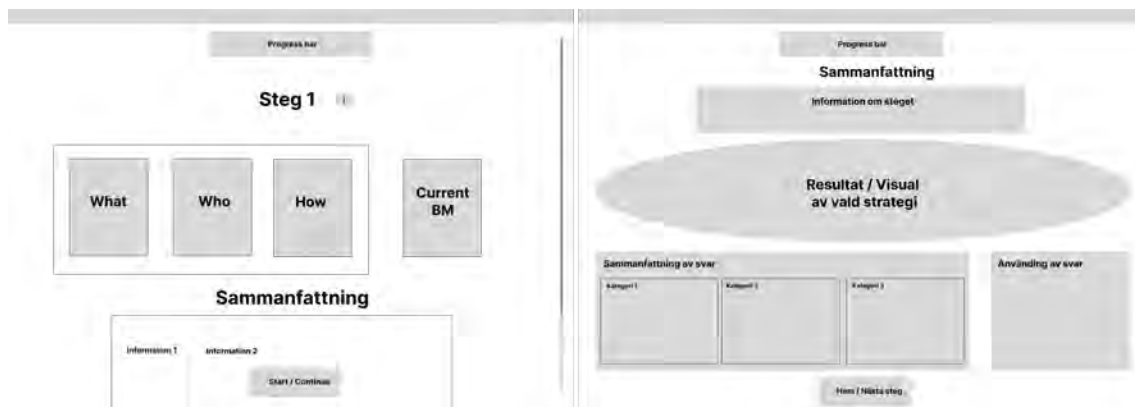


Figure 5.6: A step's overview and the layout of the summary in the low-fidelity prototype

Globally, navigation, list handling, and visual structure are kept consistent throughout the steps to ensure usability and accessibility, responding to Guideline 1.2: *High Usability* and Guideline 1.3: *Support low digital maturity*. Guidance about the step or task is included through information boxes, which fulfills Requirement 6: *Of-*

fer guidance in the process of developing a new CBM. Guidance about where they currently are through a progress bar supporting e.g. Requirement 18.2: *Show progression in development of CBM*. Navigation between steps is consistent across the application. Another global function is present when handling items in a list, to offer consistency, all lists were designed similarly.

The step-specific frames differ between the tasks, where some are repeated when the expected execution is similar. In the first and second step, the initial task is to enter information about what they do today respectively what possibilities they have moving forward. These executions are almost identical, leading to their layout being identical. To keep the entries on one page to enable moving back and forth, since the paper-framework presented all these questions on the same page, a carousel was decided upon to easily switch between the different subquestions within the task, as seen in Figure 5.7. This supports Requirement 1.3: *Support low digital maturity*, as users can navigate efficiently without switching pages.

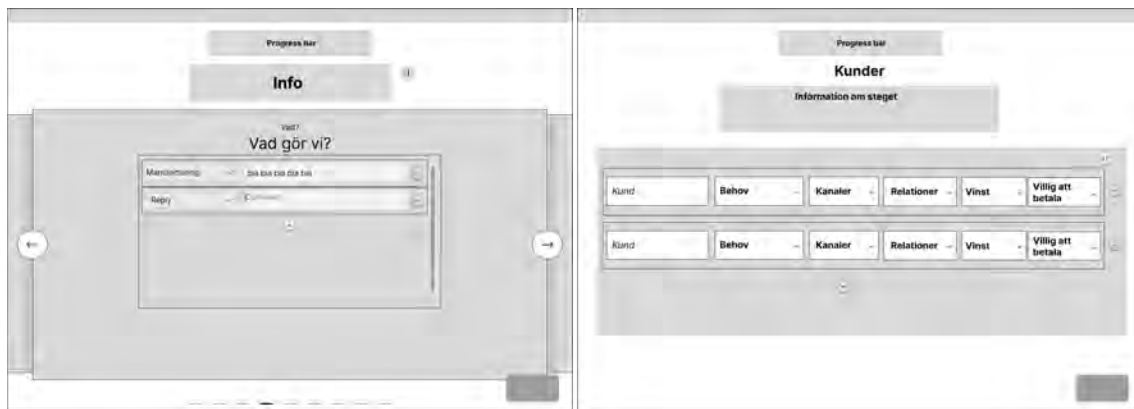


Figure 5.7: The carousel cards when entering data in Step 1 and Step 2 and the layout of handling entry-lists in the low-fidelity prototype

The second task of the first step, the user is presented with a value chain generated from their previous input, similarly to the value chain in Figure 5.8. This did not derive from the original framework, rather a result from the ideation, to bring visualization to the process to ease understanding. This is where they can choose to edit it if it would not match their idea of it through clear navigation and enabling editing of the result to ensure they feel connected to it and trust it. It answers to requirements such as 3: *Ensure feeling of trust*, as users can verify and adjust generated outputs.

The second task of the second step, to handle an already generated list, is where the user chooses one of ten existing business strategies (10R-strategies). The list items are displayed with the possibility of expanding the different rows for more information supporting Requirement 5.3: *Inform of needed logistics* and Requirement 5.4: *Inform of needed manpower*. There is also a possibility to compare two strategies, an option resulting from the brainstorming to support requirements such as 35: *Offer something the company cannot do without it*. This task is to make a decision based on their possibilities, helped by having their previous input available for them to look through without needing to navigate to different frames. The two tasks of

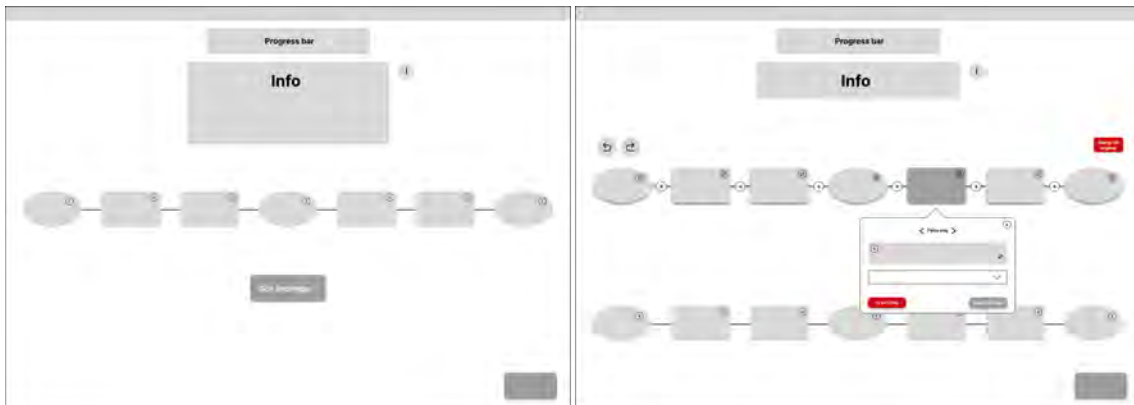


Figure 5.8: Layout for where the user can choose to change the generated value chain and how they change it in the low-fidelity prototype

the third step are similar to this task in that they handle an already generated list by either delegating activities or choosing one or several return flows. Therefore, their layout is similar, but not identical. The differences between the lists' design is their action. The decision of choosing among the strategies are placed below to emphasize that this is a big decision, instead of choosing directly in the list. When handling the activities list, the action is to choose from a drop-down menu who to delegate which activity from. The return flow is handled by checking check-boxes, to communicate that several are possible as described in Chapter 3.2.1, of which return flow alternative they want to include in their business model.

The fourth step consists of four completely separate tasks and layouts. Initially, the customer segment is a list of similar layout as previously, as seen in Figure 5.7, but with several entries in one list item representing the categories explained in the framework from CirkuTrä and RE:Furn. Based on the different categories of the list items, the list is also sortable. In this step they also fill out potential risks, similarly to the customer segment but with a different layout of the list to match the new categories identified in the framework, supporting Requirement 3.3: *Ensure feeling of trust for the new business model within the business*. The costs and revenues segment should enable jumping in between the two, hence, they are put in carousel cards as previous tasks in Figure 5.7. To add some automation, the sum is presented below the cards, supporting Requirement 26.1: *Present economic effect of new business model to the company*. When all of these are filled, they are presented with a Circular Business Model Canvas as presented in Chapter 2.3.4, which functions as both a summary and task, with their inputs already generated in the different categories. This layout is mirroring the known model for recognition, supporting Guideline 3: *Ensure feeling of trust* and its automatic function supports Guideline 35: *Offer something the company cannot do without it*.

Lastly, when the new business model is determined, they are given a full summary of all of their results and entries. In this, examples from others are included for motivation according to Requirement 25: *Get examples and inspiration of others' transitions*, as well as information of why it would be worth it. To ensure Guideline 5: *Enable understanding of the practical work of the new business model* and its

subrequirements are fulfilled, compiled information is presented of what this new business model will mean for them, what it will demand from them, and which stakeholders they should include. An overview of the final output and summary is presented in Figure 5.9.

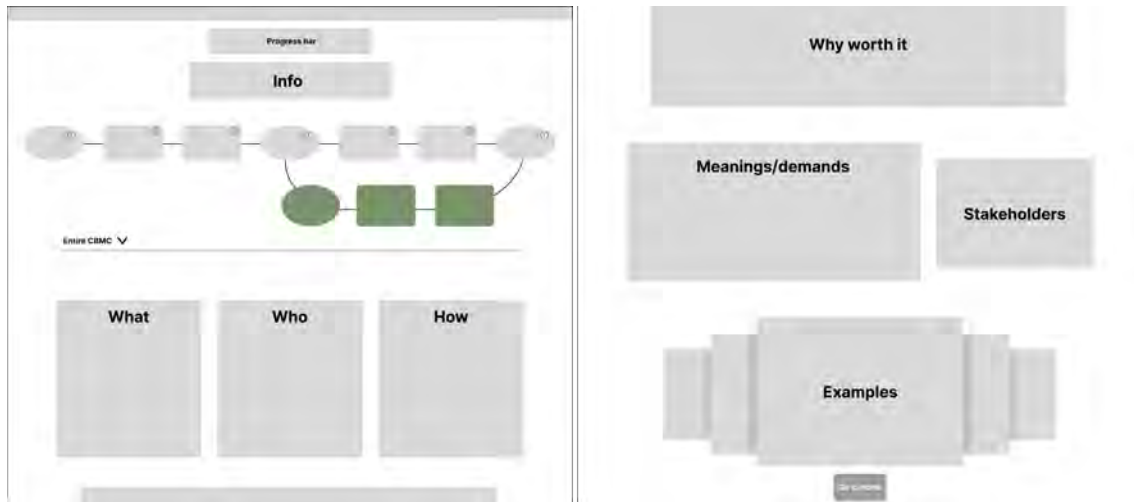


Figure 5.9: The layouts of the final summary in the low-fidelity prototype

This demonstrates how the requirements were translated into a structured and interactive solution. The lo-fi prototype then functioned as a structural foundation for the tool, allowing evaluation of how the requirements could be organized into a usable process before further refinement in the hi-fi prototype. The lo-fi prototype thus constitutes a design result in its own right, demonstrating how the identified needs and demands, for structure, step-by-step guidance, and flexible navigation, can be translated into a coherent interaction logic. The decisions made at this stage, including the carousel structure, the value chain visualization, and the consistent overview-summary pattern, reflect the design implications of working with a user group characterized by broad roles, limited time, and varying digital maturity.

This iterative ideation and prototyping process enabled a gradual transition from abstract requirements to a concrete and testable design solution. It formed the basis for subsequent evaluation and refinement for the following stages of the process. As through RtD, it also served as research method to gain more insight about the user context and the issue at hand.

5.2.7 Initial High-Fidelity Prototype

Building on the structure established in the lo-fi prototype, a hi-fi prototype was developed with sufficient fidelity to support meaningful usability testing. The requirements and guidelines in this section are referred to as they are presented in Appendix B.

Throughout, several elements are globally consistent in position, navigation, design, and content, all visible in Figure 5.10. The progress bar appears at the top of each step and in larger scale on the home page and, using circles of varying sizes and colors to represent progress. Task cards within the active step's circle mirror the overview cards and change color based on completion. Navigation buttons follow a clear hierarchy: centered primary-color buttons signal prominent actions, while next/previous buttons are placed at the bottom in secondary colors to avoid encouraging rushing, supporting Guideline 24: *Comply to process needing time to be realized*. An overview-button in the top left corner of each task frame allows users to return to the step overview at any point, supporting Requirement 1.3: *Support low digital maturity*. Finally, all task and overview titles carry information icons - replacing the lo-fi prototype's always-visible information boxes - which open a pop-up containing the question's meaning, purpose, stakeholders to involve, and an example. The overall structure of each step follows the pattern established in the lo-fi prototype: an information pop-up on first visit, an overview of tasks displayed as cards, individual task frames, and a step summary. This structure is consistent across all four steps and is not repeated in the step-specific descriptions below.

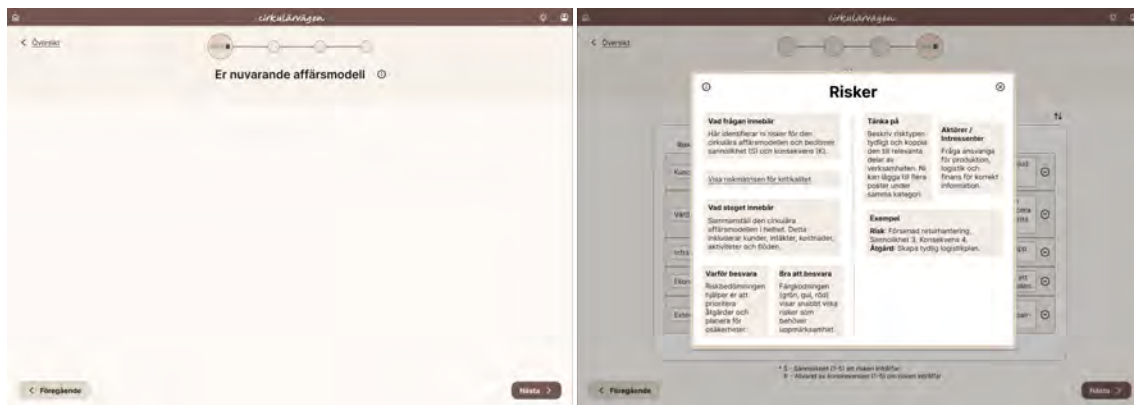


Figure 5.10: Representation of the global elements in the tool

The **home page**, shown in Figure 5.11, refined the lo-fi structure by elevating the facts box into expandable and changing over time. The progress bar is refined with design elements with step and task labels, maintaining consistency with how steps are named throughout the tool. The carousel of examples are refined to include images and texts regarding how others have worked with circularity.



Figure 5.11: Home page in its extended form in the high-fidelity prototype

The **first step** overview, shown in Figure 5.12, groups the initial three cards to signal their collective purpose, with the fourth task locked until the others are completed. Already entered data is visible in the overview to support asynchronous work. They can enter the different steps to edit the data. This layout is consisted throughout the overviews of each steps, where the second step's is identical to the first, while the third and fourth changes the cards to having only two and four individual cards instead of any grouped. After they have executed the tasks within the first step, they are presented with the summary presented in the right frame in Figure 5.12. This includes a visualization of the second task in the step, of the generated and potentially edited value chain of their current work. All the steps' summaries have this layout with the visualization changing to relevant information for that step.

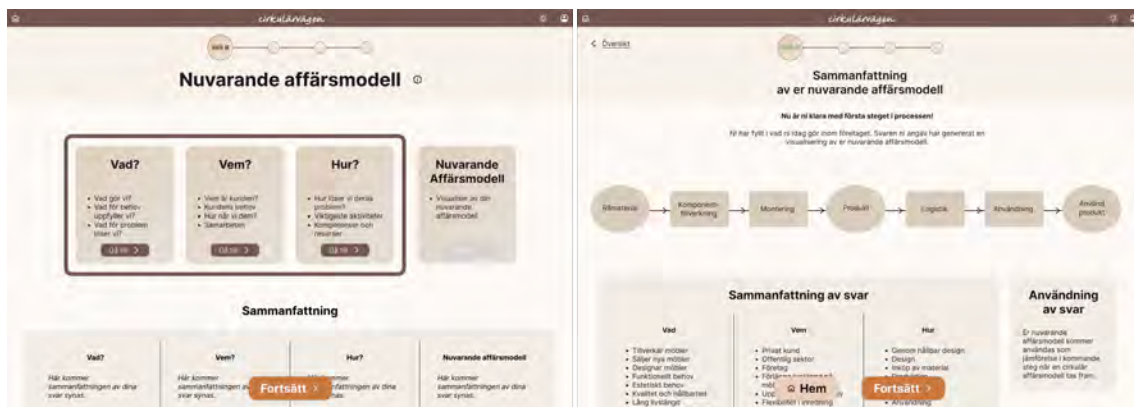


Figure 5.12: The overview and summary of the first step in the high-fidelity prototype

The tasks within the first step are displayed in the first frame in Figure 5.13. Initially, the carousel explained in the lo-fi prototype, here refined with typographic hierarchy to distinguish question titles from categories, and a clickable information icon per card. A navigation bar below the cards indicates the current card and enables direct navigation between questions. The list they add into is of the same style as actionable lists throughout the interface where they can add or remove items, or change existing items directly. The second task presents a generated value chain based on the previous entries, where squares represent process steps and ovals product stages. Users can confirm or edit it through a dedicated editing view showing both the original and editable versions side by side, with options to change, remove, or reposition blocks, and undo or reset changes. This supports Requirement 3: *Ensure feeling of trust*, as users can verify and adjust the generated output.

The first tasks of the second step is identical in its design to the first task in the first step, as seen in Figure 5.13. The second task is to choose between the different 10R-strategies and is shown in different forms in Figure 5.14. The hand icons at the left part of the strategies are placeholders for the icons representing each strategy. The previous input is always available in the drop-down "Tidigare svar" (Previous entries). When they have made their decision, they move forward to the summary presented above. The interactions with the list is displayed in Figure 5.14. If the user expands a specific strategy by pressing its row or drop-down arrow, it presents lists as the first



Figure 5.13: The tasks within the first step in the high-fidelity prototype

frame in the figure. This includes a deeper description of the strategy together with a link to read more about it, enabling trust in and understanding of the strategies. A list of the strategy's demands is also presented with checked items if they are already fulfilled based on what they have entered in the previous task, this answers to Guideline 5: *Enable understanding of the practical work of the new business model* and its subrequirements. This checklist also generates the percentage displayed on each strategy, representing how well the strategy meets their available resources, offering automation in the process, supporting Guideline 35: *Offer something the company cannot do without it*. Lastly, an example is presented for each strategy according to Requirement 25: *Get examples and inspiration of others' transitions*, and a comparison function allows users to view two strategies side by side to support decision-making.

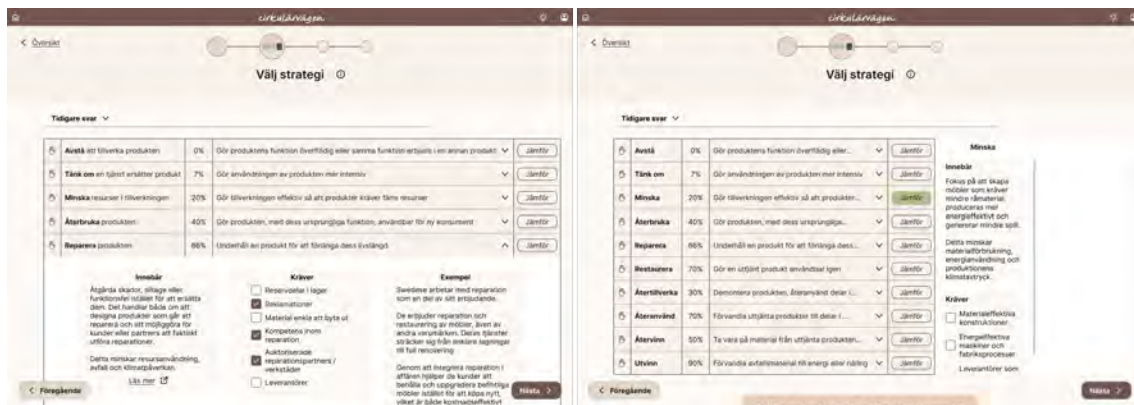


Figure 5.14: The actions made through interactions of the strategy list in the second step of the high-fidelity prototype

The third step regards activities and return flows, which are the two tasks to execute. This will result in a new value chain for their business model, presented in its summary based on the initial value chain with added blocks representing their additional CBM. The tasks uses lists visually similar to the list of strategies. The activities are generated from the decided strategy based on what CirkuTrä and RE:Furn have developed. These activities are then delegated through a drop-down list where they

can either choose between existing actors or add a new one. These will be added to the stakeholder to include in later steps. The return flows are chosen between through check-boxes, showing the users that multiple choices are possible. In each list, the rows are expandable showing more information similarly to the list of strategies. When completed, the user moves to the summary where the new circular parts are added to the original value chain.

The last and **fourth step**, to define their new CBM, concludes of four steps, where the final task works as both a summary and task with editing possibilities. The first two tasks are presented in Figure 5.15 where the first is to define their customer segment. The list is of similar character as previously although it differs since the inputs now depend on the tasks in the framework in Chapter 2.3.4. The user defines customers through several aspects, and the resulting list can be sorted accordingly. The second task is to enter their costs and revenues as explained in the lo-fi prototype. As in previous carousels, information icons provide additional explanations. Since there are only two cards, they cannot navigate in a full carousel circle, rather back and forth between them.

Figure 5.15: The first two tasks within the first step in the high-fidelity prototype

The final entry task is shown in the first frame of Figure 5.16. This is where they enter their risks with the new business model, enabling grading it and finding a solution should it occur. The colored square reflects the combined probability and severity of each risk. This list is handled identically as the previous lists. The final task presents a CBMC populated from previous tasks, supporting Requirement 2.4: *Enable concretization of the company's new circular business model*. It mirrors the traditional canvas format. A distinctly colored "Klar" (Done) button communicates the finality of confirming the business model.

If, however, they want to change something presented in the CBMC they press the relevant block, such as in 5.17 and are presented with pop-up informing them about where the information is generated from, enabling navigation to the relevant task as well as warning them of the consequences if changing entries in previous tasks, to ensure full understanding of the consequences of their actions. To re-enforce this, if they do change something, the next tasks are supplemented with either a "correct" or "error" colored box explaining what has been affected and what should change in the task. This is displayed with an example in the right frame in 5.17

Risker

Risiktyp	Beskrivning	5*	4*	Hantering
Kundrisiko	Lågt kundintresse för reparation	3	4	Informera om fördelarna, erbjuda gratis och smidig bokningssystem
Värderisiko	Reparationskostnaden ökar	2	5	Standardisera processer och kvalitetskontroller. Kommunera tydligt vad kunden kan förvänta sig
Infrastruktur	Bristande kapacitet att hantera renhållningen och service	4	4	Bygga i fler skolor och växa upp successivt
Dynamisk	Reparationsgången för utrustning i början	3	5	Testa gången i pilotform för att optimera processen och flöden
Extern	Regulatoriska förändringar eller ökade krav på dokumentation	2	4	Följa utvecklingen från B2B EcoDesign- och Right-to-Repair-utveckling

* 5 = Sammanfattning (5-5) av riskerna i affären
* 4 = Övervakning av riskerna (5-5) och inga åtgärder

Sammanfattning av er cirkulära affärsmodell

Nyckelpartners

- Användare med verktyg
- Kommer i samarbetsform med andra aktörer
- Digitala verktyg
- Skapande av nya produkter
- Logistiksystem
- Skapande av nya produkter
- Digitala verktyg
- Skapande av nya produkter

Nyckelaktiviteter

- Komponent-utveckling
- Montering
- Användning
- Reparation
- Skapande av nya produkter
- Logistiksystem
- Skapande av nya produkter
- Digitala verktyg
- Skapande av nya produkter

Värdeerbjudande

- Reparation
- Ett utbud av en produkt för att förbättra dess användning
- Mindre resursanvändning, arkiv och skrotborttagning

Kundsegment

- Offentlig sektor
- Privatkund

Kanalstrukturer

- Både fysiska och digitala kanaler
- Kanaler för uppföljning och återkoppling
- Kanaler för uppföljning och återkoppling
- Kanaler för uppföljning och återkoppling

Inkomstströmmar

- Skapande av nya produkter
- Skapande av nya produkter
- Skapande av nya produkter
- Skapande av nya produkter

Klar

Figure 5.16: The last two tasks within the first step in the high-fidelity prototype

Sammanfattning av er cirkulära affärsmodell

Kundsegment

- Offentlig sektor
- Privatkund

Resultaträkning

Dina åtgärder har inte påverkat något i denna segment

Kostnader	Service
Arbetskraft	Utskott och repar. 10 000
Material och komponenter	Utskott och repar. 12 000
Tjänster	Utskott och repar. 8 000
Administrativt	Utskott och repar. 7 000

Summa av kostnader: 145 000
Summa av intäkter: 255 000
Resultatsumma: 110 000

Klar

Figure 5.17: Representation of how a change from the CBMC would generate actions within the interface

5. Process

The last summary, presented in Figure 5.18, retained the structure from the lo-fi prototype while refining the visual presentation. The reuse of "What?", "Who?" and "How?" from the first step with updated data was introduced here to create recognition and help users connect the new business model to their existing one, supporting Requirement 5.

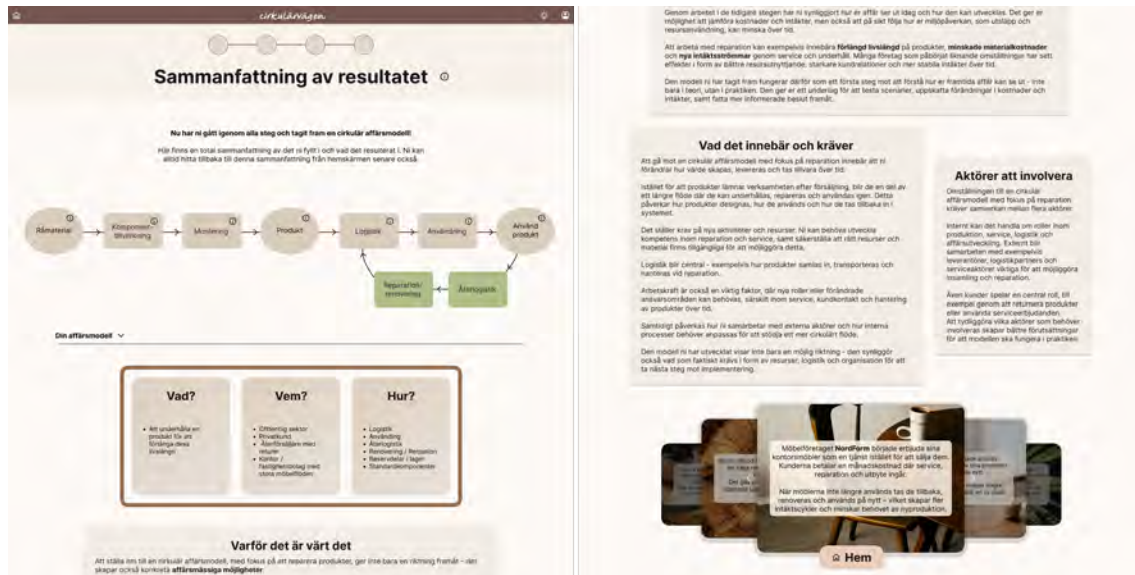


Figure 5.18: The final summary in the high-fidelity prototype

From the summary, they can navigate to the **home page** where they are now met with the possibility of initiating a new business model. This supports Requirement 34: *Focus on adding an additional business model instead of a full switch* to evolve their business model gradually and working with several simultaneously. In this frame, the progress bar is in its default mode where no particular step is highlighted.

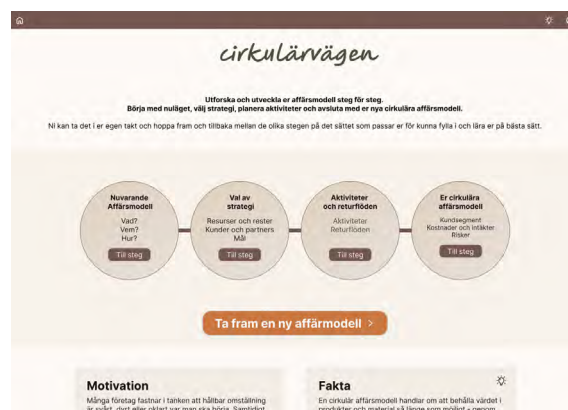


Figure 5.19: The home page after being done with a process in the high-fidelity prototype

Together, these design decisions constitute a set of interaction design responses to the needs and demands identified in the Contextual Phase. The choices made around information hierarchy, visualization, and guided navigation reflect the demands of a user group with varying competencies, limited time, and low digital maturity [3, 29]. The hi-fi prototype demonstrates how interaction design can operationalize circular business model support in practice - translating abstract framework content into structured, navigable interactions.

5.3 Usability Phase

Building on the prototype developed in the Contextual phase, the Usability phase introduced a cycle focused on evaluation and refinement. The discover phase consisted of a usability test with users, followed by a thematic analysis to define insights and update requirements. These informed a targeted refinement of the prototype, resulting in the finalized high-fidelity prototype as the phase's deliverable.

5.3.1 Discover through Usability Test

As this phase builds upon prior research and established design decisions rather than exploring the problem space anew, this discover phase constitutes a focused evaluation of specific design choices rather than an open-ended inquiry. The hi-fi prototype was tested through usability tests with three of the participants from the initial interviews - P3, P4 and P5. To make the test conditions as realistic as possible, a scenario was constructed in which the participants could engage with the tool in a context resembling their actual work situation, as described in Chapter 4.2.4. The full manuscript, with scenario and tasks, are presented in Appendix O. The scenario placed the participant in the role of a company representative who, motivated by market demand and competitors' adoption of circular practices, had decided to develop a new circular business model with the support of the tool. It was specifically designed to capture how participants experienced uncertainty about the outcome, how they navigated a tool that had already been partially completed by others, and how well the tool supported a collaborative working process where multiple people contribute over time. The prototype was adapted for the test such that only the interactions necessary for completing the tasks were fully functional. However, the most important flows were intact, and where relevant, multiple navigation paths were available to simulate realistic use.

The test consisted of three tasks, presented in the Appendix O, during which participants were asked to think aloud - continuously verbalizing their thoughts, interpretations, and reactions. The tasks were formed to ensure testing of the majority of the interface and its crucial steps. The first task concerned the tool's opening step, in which participants added information about their current business model, reviewed an overview of their inputs, adjusted a visualization of their business model flow, and verified a summary of the completed step. The second task focused on strategy selection, where participants navigated an information structure to find guidance and requirements for a specific strategy, compared two strategies, made a selection,

and reviewed a summary of the step. The third task addressed the final step of the tool, where participants located and reviewed the emerging circular business model canvas based on inputs added by their colleagues, corrected an entry, and finalized the business model by confirming a summary.

The sessions were conducted digitally, with both screen and audio recorded separately to enable transcription and later review. Notes were also taken during the sessions. By reviewing the recordings, time spent and number of clicks per task could also be derived. After each task, participants were asked a set of questions regarding how they had interpreted and understood that part of the tool, and how they experienced it. They also rated their confidence in having completed the task correctly on a scale of 1-5. Participants were also asked whether they found the summaries clear and whether anything felt missing. At the end of the session, broader questions were posed concerning their overall impression of the tool, whether they trusted the results it generated, and whether they would use it in their work. Participants were also given the opportunity to raise any additional reflections not covered by the structured questions. The collected answers from this sessions is shown in Appendix R.

5.3.2 Define through Analysis

The usability test data were then compiled and analyzed using the same thematic analysis approach applied after the interviews, as described in Section 5.2.2, an example shown in Figure 5.20. Transcriptions and session documentation were used as the basis for the analysis. Observations and statements from the participants were transferred to individual notes on a digital board in FigJam and iteratively grouped into themes and subgroups, all available in Appendix G, reflecting patterns in how participants reacted to and navigated the tool.

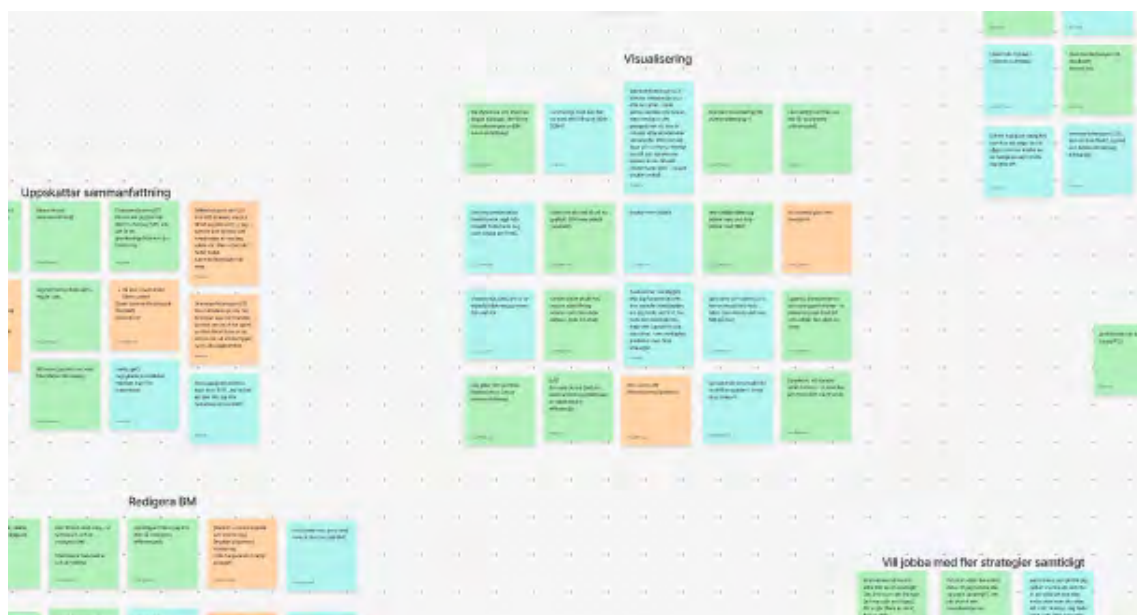


Figure 5.20: Example of the grouping in the KJ analysis after usability tests

The resulting themes were reviewed and requirements and guidelines emerged. A new list was created to separate the two iterations of findings, where the same MoSCoW and *ACD*³-inspired structure was used for this phase, as the analysis of the literature study and interviews. The updated set of requirements and guidelines formed the basis for the changes carried out in the subsequent develop phase.

The quantitative data was analyzed through mean and median per participant and per task and compared to the optimal amount. Since the user test included a smaller group of participants, the mode would not be beneficial to calculate. To compare, the number of clicks and time per task was stated relative to the minimum required to complete each task. Also the 1-5 numbers from the participants' replies were analyzed through mean and median combined with the qualitative data as to why they replied in this way. This qualitative data was primarily intended to inform the development work and identifying pain points. The 1-5 question of confidence informed of how fulfilled some existing guidelines were that are more difficult to measure specifically. The quantitative observations from the sessions are presented in the following section.

5.3.3 Observations from the Usability Tests

The amount of clicks and time per task was measured regarding each participant. These were then compared to the optimal amount. These are presented in Table 5.2 and Table 5.3. P5 did not execute usability task 1.2, to navigate to the overview after filling out the carousel in the first step, which marks the deviation with an amount below the optimal in the tables. Similarly, none of the participants succeeded with Usability task 2.1.1, to find information about who to talk to regarding the task of choosing strategy. In Usability task 2.2, P3 navigated differently than expected and therefor succeeded with one less click than the intended path. In a similar way, P4 chose a different navigational path in Usability task 3.3. The amount of trust they expressed after each task is presented in Table 5.4 where the median goes from 2, to 3, to 4. The lower felt trust in the initial usability task could correlate with the amount of clicks and time spend on that task exceeding the optimal the most. The result could also indicate increased trust over time spent with the tool.

Table 5.2: Number of clicks per task compared to the optimal number of clicks per task

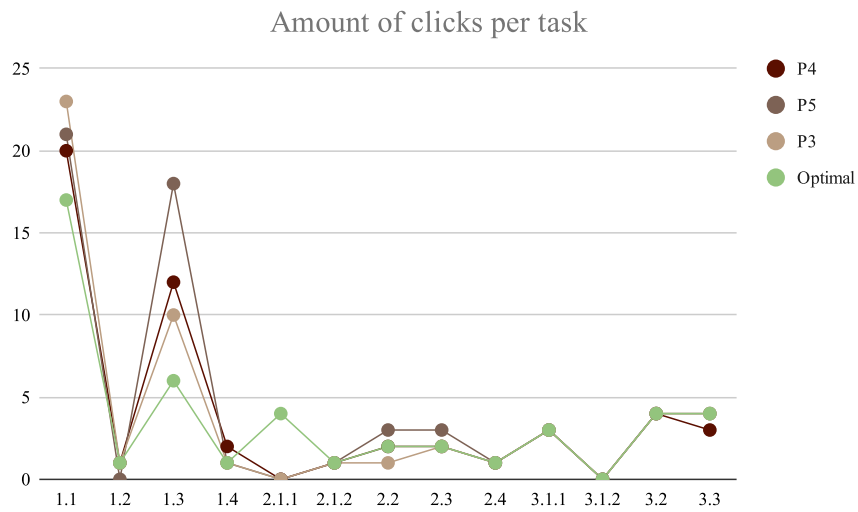


Table 5.3: Seconds spent by the participants per task compared to the optimal time

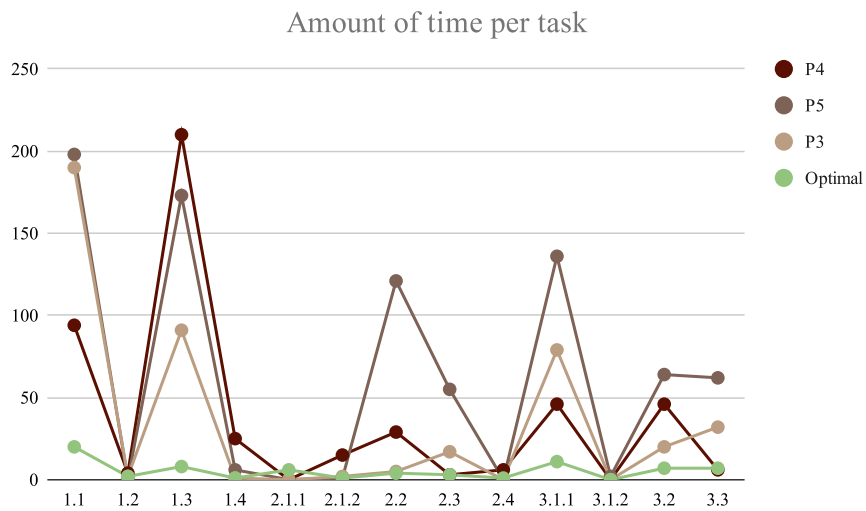


Table 5.4: Experienced trust expressed by the participants after each usability task



A notable observation across sessions concerned task completion time. Although all participants took longer than the minimum required time in the succeeded usability tasks, this was not interpreted solely as a usability problem. Findings from the interviews in the Contextual phase highlighted that developing a CBM is inherently a time-consuming process requiring reflection, discussion, and iteration. The time participants spent reading, pausing, and reconsidering their inputs may therefore reflect appropriate engagement with the content rather than friction in the interface. This distinction informed how time data was interpreted in the analysis - longer completion times were flagged for further investigation when accompanied by visible confusion or moderator assistance.

All three participants required more clicks than the minimum to complete **Usability task 1**, e.g. with click counts on Usability Task 1.1 of 20, 21, and 23 respectively against the optimal of 17, as seen in Table 5.2, and completion times ranging from approximately 3 to 4 minutes, as seen in Table 5.3. Several participants hesitated at the entry point of the step, uncertain about where to begin and how the card structure related to the broader interface. Two participants did not initially notice the navigation arrow between cards, and as a result navigated unintentionally past certain cards. All three required some form of moderator assistance when adjusting the business model visualization. The function of moving the block in the value chain was eventually found by all participants but was not immediately discoverable, and multiple participants expressed a preference for drag-and-drop interaction instead. More broadly, participants expressed a need for multiple ways of manipulating the business model visualization, including removing, adding, copying, and moving blocks. The visualization itself was received positively once reached, with participants describing it as clear and logical. Confidence ratings for this task were the lowest across all tasks, averaged 2,67 across participants (median 2), as seen in Table 5.4, with lower scores attributed primarily to uncertainty about the pre-filled content and the collaborative scenario rather than the interface itself.

Usability task 2 generated the most navigation difficulties across the three sessions. The subtask of identifying who to consult, Usability task 2.1.1, was not completed successfully by any participant - all three clicked and explored but did not interpret the actor information as the intended answer, with one participant explicitly stating they did not understand the question. Time spent on this subtask ranged from 15 seconds to nearly 4 minutes, as seen in 5.3. The strategy comparison function was used by all participants but was not immediately understood due to limitations of the prototype. Participants initially pressed buttons where no action had been assigned and therefore assumed that the function has no purpose. After prompting the correct interaction they understood and appreciated the function.

The percentage indicator displayed alongside strategies was misunderstood by all three participants, who guessed it referred to environmental savings, resource use, or prioritization rather than its intended meaning of match with the company's profile. One participant guessed it related to environmental savings, while another associated it with resource requirements, neither connecting it to the tool's intended meaning of strategic fit. All three participants expressed a desire to select multiple strategies simultaneously rather than one at a time, noting that their real-world operations involved several circular strategies in parallel. Confidence ratings for this task were averaging 3 (median 3), as seen in Table 5.4.

Usability task 3 was experienced as the clearest and most satisfying of the three. All participants navigated to the correct location with minimal assistance, and click counts were lower and more consistent than in previous tasks, notable in Table 5.2. The CBMC-task was described positively by multiple participants as visually clear and meaningful. Two participants did not initially perceive the cells in the CBMC as directly editable, and required prompting before interacting with the content. Confidence ratings for this task averaged 3,86 (median 4), the highest across all three tasks as presented in Table 5.4, with participants attributing higher confidence to clearer task structure and a stronger sense of the overall outcome.

In the **closing questions**, all three participants expressed that the tool would be useful for SMEs less familiar with CBM concepts, even if those already working actively with circularity found it less immediately necessary for their own use. One participant described the tool as helpful for documentation and structured reflection, particularly in combination with workshop-based work. This informed the new requirement 44.1: *Include use of workshop to execute the tasks*, as well as to indicate next steps in the broader circular transition process. The value chain illustration in the final summary was noted by one participant as particularly effective in communicating what had changed in the business model. Trust in the results generated by the tool was generally positive, conditioned on the quality of the inputs provided. Several participants suggested adding source references to the output summaries to increase credibility.

5.3.4 Themes Emerging from the Usability Tests

The **thematic analysis** of the test data resulted in eleven overarching categories reflecting shared patterns across participants. They are all available in Appendix G. This informed an updated set of requirements and guidelines through thematic and quantitative analysis, presented in Appendix H, which is what is referred to in this chapter. These in turn guided the refinement of the prototype. A full overview of the updated requirements and guidelines, including MoSCoW prioritization and ACD³-inspired structured with cause-effect relationships, is available in Appendix K.

The largest category from the KJ analysis, *Need for greater interface clarity*, captured a broad range of issues spanning navigation, interaction affordance, and content comprehension, informing Requirement 62.4: *Adapt interface to low digital maturity*. Participants appreciated consistency in the interface but struggled to identify clickable elements, understand what certain interactions would do, and interpret guidance-free interface elements. P4 noted that the navigation arrow between cards was easy to overlook, describing it as simply too small to register, while P3 emphasized that the interface needed to be unambiguous, noting that many users are not accustomed to working with schematic tools. This category informed several updated and new requirements, including Requirements 62.3: *Offer clear correlation between functions' design and their actions*, and 62.31: *Offer clear understanding of which are clickable elements*, addressing visual affordance of interactive elements. As well as Requirements 63.3: *Offer understanding of how to execute the tasks*, 63.4: *Offer understanding of what type of answers are expected*, and 63.5: *Offer deeper understanding of what the questions means* addressing step-level instructional text, and Requirements 50.5: *Enable handling lists in multiple ways*, and 62.2: *Offer clarity of where the user is in the interface*, addressing navigation clarity. Further requirements addressed the need for an introductory overview of the tool and its process in Requirement 63.1: *Offer introduction of the tool and its tasks*, as well as encouraging users to spend adequate time on each task in Requirement 59: *Encourage users to spend time on each task*.

Missing information in the tool reflected a consistent need for richer contextual information throughout. Participants wanted to understand what different strategies mean in practice, what services they imply for their customers, and what is required beyond the tool's contribution. Trust in the tool's content was also raised - participants questioned what the information was based on and requested source references in the output. P4 suggested that *"a footnote might be enough"* for the results summary. The subcategory *Regulatory requirements are important to include* was raised independently by multiple participants as a notable missing aspect, with requests to include regulatory context both when selecting strategies and in the final summary. These insights led to new requirements related to information depth, source transparency, explanation of the 10R framework, and the inclusion of regulatory and practical strategy information.

The categories *Want to work with multiple strategies simultaneously* and *Want to prioritize among strategies* together reflected a shared experience that the current one-at-a-time approach felt limiting. All three participants noted that their real-world operations involve multiple circular strategies in parallel, and expressed a desire to compare, prioritize, and eliminate strategies rather than select a single one. P4 stated: *"We use six or seven of them"*, and P5 suggested a grading or SWOT-style approach to rank strategies by feasibility and impact. These findings led to updated requirements around multi-strategy handling and prioritization support, as well as new requirements for mapping tools such as SWOT and KPI integration seen in Requirements 48.1: *Enable inclusion of KPI in the mapping of strategies* and 48.2: *Enable inclusion of SWOT-analysis in the mapping of strategies*.

Appreciation for visualization was one of the more positive categories, with participants responding well to the value chain visualization and the CBMC. However, several expressed a desire for more visual content throughout the tool, a more dynamic business model visualization, and clearer visual separation of information. P5 summarized: *"The value chain and the BMC - those are the visual images I remember from this"*. This led to new requirements including visual elements throughout the tool, layered and more dynamic business model visualization, the possibility of representing the circular business model as a circle, and clearer differentiation between editable and non-editable visual content.

Multiple ways of editing the business model is appreciated captured participants' desire for more flexible interaction with the business model visualization. While the move-step function in the value chain was appreciated once discovered, participants consistently expressed a preference for drag-and-drop as the primary means of re-ordering elements, as well as the ability to remove, add, and copy blocks. These findings informed new requirements enabling drag-and-drop functionality, block-level editing actions, and the possibility of building more complex, layered business model representations.

Appreciation for summaries confirmed that the summary and overview functions were valued, particularly for enabling participants to orient themselves in the collaborative scenario. *Good that multiple paths are available in the tool* captured appreciation for flexible navigation and interaction modes, while *Understands the tool* indicated that despite difficulties, participants generally understood what they had accomplished and trusted the outputs. Finally, the category *It is important to take the time* reflected an important nuance: although participants took longer than the minimum required time, this was not interpreted solely as a usability problem. The interviews in the second phase had already established that developing a circular business model requires reflection and iteration. Longer completion times accompanied by active reading and deliberation were therefore treated as appropriate engagement, and the category informed a new requirement to actively encourage users to spend time on each task rather than rushing through.

Across these categories, several patterns emerge that connect to the theoretical context established in Chapter 3. The recurring difficulties with navigation, affordance, and interface comprehension are consistent with Fritscher and Pigneur [29] and

Nikolic and Dahlberg [48], who emphasize that SMEs exhibit low digital maturity and require tools with strong visual communication and clarity. The expressed need for richer contextual information, source transparency, and regulatory guidance further reflects Szopinski et al. [30]’s finding that no existing tool fully addresses the range of functions practitioners require. The appreciation for visualization and summaries alongside the difficulties with unaided navigation together suggest that the demands emerging from this group extend across both content and interaction design. These findings contribute to both needs and demands, and the experienced effect of the digital tool as they deepen the picture of what furniture SMEs need when planning circular business models, and indicate the conditions under which a digital tool can realize its potential effects.

5.3.5 Develop through Brainstorming

To initiate this stage of ideation, the requirements and guidelines were reviewed to gain insight in which were fulfilled and which needed further development. Some of the data from the usability tests were straightforward and concrete, such as adding interface elements, adjusting affordance or restructuring specific sections. The solution were sometimes obviously expressed and needed little to no ideation to be decided upon. Other data concerned the overall experience of the tool, where the intended effect was clear but the most appropriate solution required discussion and iteration during development, as experiential qualities are inherently more subjective and difficult to resolve conclusively.

A conflicting requirement emerging was Requirement 60: *Enable working with several strategies in one process*, where users expressed a desire to select multiple strategies from the list and continue with a combined business model. After discussion with CirkuTrä and RE:Furn, this was declared beyond the study’s scope and therefore defined as a ‘Won’t have’ requirement.

To continue ideation for the solutions fulfilling the requirements and guidelines in this stage, a form of *brainstorming* was used. The requirement and guidelines reviewed are the most critical ‘Must have’ and ‘Should have’s identified across the Contextual and Usability phases. Requirements that remain unaddressed, due to scope or time constraints, are documented for future work. The unfulfilled requirements were listed and divided into which frames of the prototype they regarded. From here, each frame was discussed sectionally and each requirements individually. No set time was used, rather discussion if previously used interface elements could be re-used or new ones decided upon. Ideas were compared and decided upon in regards of which would mean the most consistency with the interface at the same time it fulfilled the requirements. The decided solutions were documented connecting to each requirement.

5.3.6 Deliver through Refined Prototype

Similarly to the deliver stage of the first phase, a Pugh-matrix inspired evaluation was executed through discussion regarding the generated ideas to understand which fulfilled the requirements and guidelines. They were compared to the list of 'Must have' and 'Should have' requirements and guidelines. The resulting lists is available in Appendix Q and gave a gap analysis of which were unfulfilled and needed to be addressed through additional ideation in the form of brainstorming. This was done during the ideation and following it, to ensure all requirements had ideas working as solutions. With this done, the prototype could be refined.

To preserve the tested prototype, a new file was created in Figma as a copy of the initial high-fidelity prototype. All refinements were developed within this copy. The high-level changes were made in components outside of the frames to ensure the same changes on all frames through minimum time and effort. For low-level changes, each frame was reviewed and the generated changes were made, regarding both visual elements and informational content.

This prototype became a refined prototype subsequently evaluated in the fourth phase for final refinements. That evaluation is directed at informing future development together with further refining, possible in the time frame, of the prototype itself. Its fidelity is of the same level as the initial high-fidelity prototype. All frames from this prototype are available in Appendix I. In this chapter, the requirements and guidelines are referred to as they are presented in Appendix H, with only the ones emerging from the usability tests, or in Appendix B when they refer to previously identified requirements and guidelines.

Among the concrete changes previously referred to, were complementing the X-button on automatically appearing information overlays with an OK/confirm button. This supports new requirements such as 50: *Enable multiple navigational paths through the tool*. Many users did not open the information pop-up when searching for needed information, but instead preferred having the information available before executing tasks. The pop-up was therefore redesigned to appear initially when users reach a task, allowing them to read the information before continuing. The carousels represented another clear issue, where arrows had low perceived visibility and users expressed a need for clearer indication of their position within each card. The cards were therefore complemented with numbering at the bottom and more prominent arrows on hover, indicating which question the user is navigating to when clicking. These changes are shown without hover in Figure 5.21. This was informed by a clear deviation in clicks during task 1.1 and now supports Requirement 1.2: *High usability* and Requirement 1.3: *Support low digital maturity*.

Other concrete changes included the refinement of the value chain interaction following the clear deviation in clicks in task 1.3. Affordance was improved through more prominent visual cues highlighting the active block, drag-and-drop was added as the primary interaction for reordering, and copy-paste functionality was introduced. These changes are shown in Figure 5.22 and support Guideline 52.2: *Differentiate clearly which business model is changeable and not* and Requirement 58.1: *Enable changing the visualization of the current business model through multiple actions*.

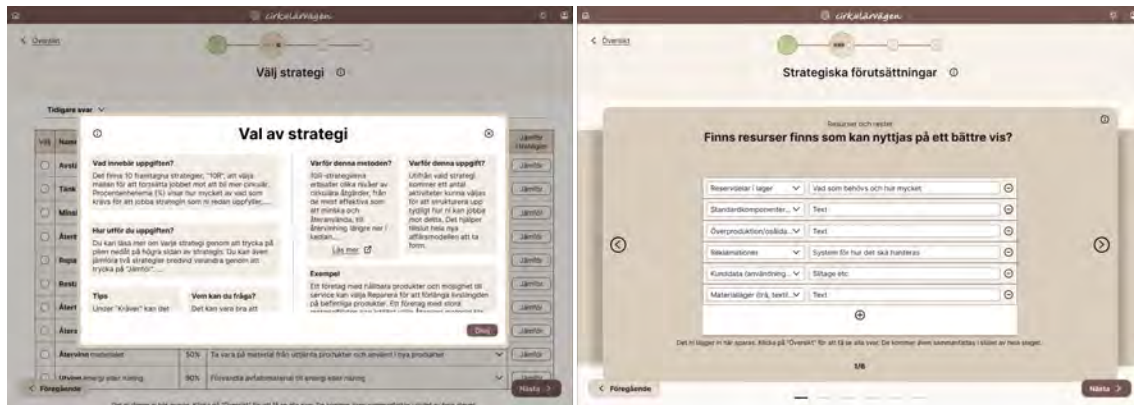


Figure 5.21: Information pop-up with OK button, and numbering of cards in carousel

The terminology for the business model visualization was updated from "affärsmodell" (business model) to "värdekedja" (value chain) to better reflect participants' mental models, and a clearer visual distinction was introduced between the editable and non-editable versions of the visualization.

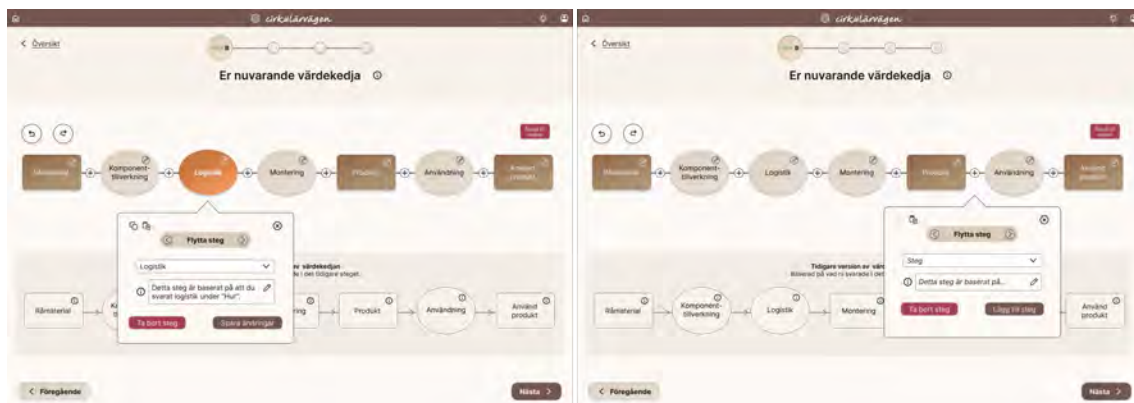


Figure 5.22: Value chains more visually distinguished what is changeable

In the strategy step, several concrete changes were made: the percentage indicator was more explicitly labeled, direct strategy selection was enabled through a radio button as a prerequisite for proceeding, and non-interactive checkboxes were replaced with check marks to remove ambiguity. These changes support, among others, Requirement 50: *Enable multiple navigational paths through the tool with its subrequirements regarding the strategy list*, and are shown in Figure 5.23. The informational lists are displayed in the summary which is mirroring the expanded version of the strategy list. A column of relevant regulations was also added to the strategy list and its summary view, supporting the repeated Requirements 42.1: *Include information about regulations when choosing between strategies* and *Inform of what the strategy would mean in practice*. All contributing to another repeated guideline, 46: *Increase trust in the information regarding different strategies* and its subrequirements.

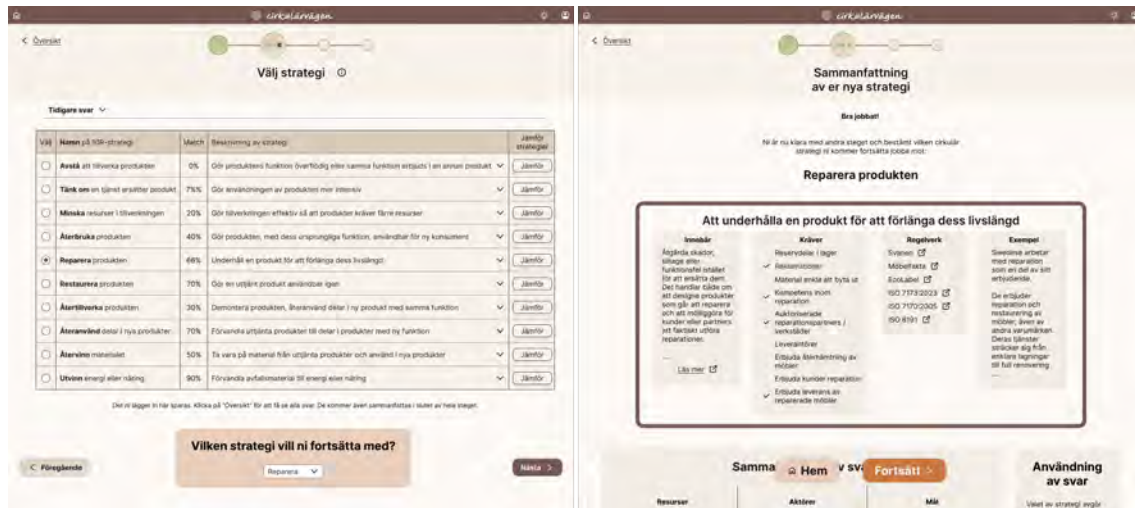


Figure 5.23: Choose strategy with updated radio buttons, top bar explaining columns and automatic choice, and summary with check box exchanged

CBMC block affordance was strengthened through more prominent hover states to signal clickability. The confirmation button was renamed from "Klar" to "Fastställ" to better communicate the finality of the action, accompanied by a confirming dialogue box as presented in Figure 5.24, alerting the user to the irreversibility of the step.

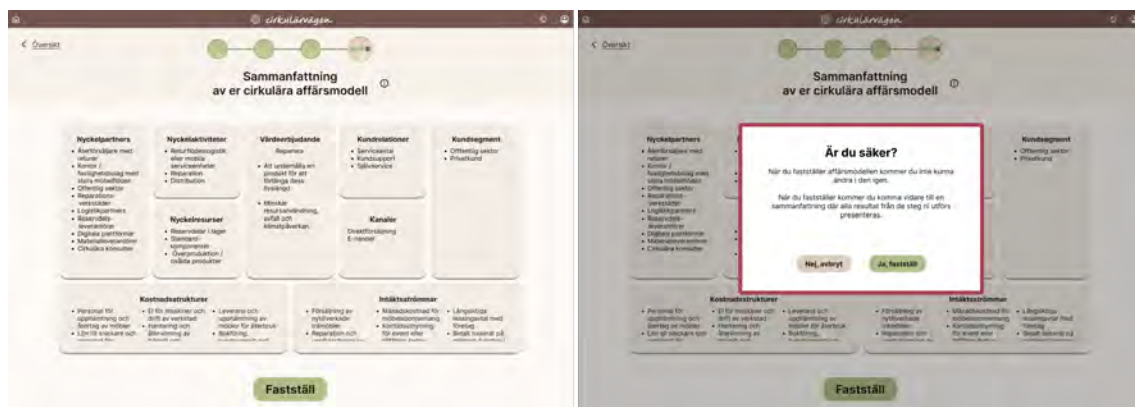


Figure 5.24: More distinguished clickable elements in CBMC, and updated pop-up for confirming

Additionally, information about regulatory requirements and relevant certifications was incorporated into not only the strategy information, but the final summary as well, structured in its own dedicated space within the interface. This supports both Requirement 42: *Include information about regulations and its subrequirements* such as 42.3 *Enclose information about regulations in its own space in the interface*. The information in the final summary has been changed and expanded to support new insights. More visual elements were used to follow the users' appreciation of it, and Requirement 52: *Include visual elements throughout the tool*, shown in Figure 5.25. The summary now shows more clearly the results regarding economics, environmental effect and the practical work it will mean. This supports repeated

requirements such as 41: *Inform about improved carbon foot print when choosing between strategies* and 43: *Inform of what the strategy would mean in practice*, as well as original requirements such as 26.1: *Present economic effect of new business model to the company*.



Figure 5.25: Summary of the process with more information

A change requiring more discussion concerned the instructional text within each task, which was focused on following new requirements and the results where no participant succeeded in finding the requested information in usability task 2.1.1. While the need for guidance on what to fill in and how, including examples of how inputs could be formulated, was clear from the test results, the most appropriate tone, level of detail, and placement required iterative consideration to avoid adding cognitive load rather than reducing it. As one participant noted, *"the person taking this in may not always have finished high school"*, underscoring the importance of accessible language and clear formatting throughout. The layout presented previously in Figure 5.21 now supports new requirements such as 47: *Ensure trust for the chosen methods in the tool* with an example according to Requirement 47.1 *Explain the 10-R framework*. At the bottom of some information texts, to enable deeper understanding and transparency, a source is presented to read more. Displayed in the same figure is the information texts regarding that all inputs in the tool are automatically saved was also a change made to answer the users need for understanding the tool better. This supports Requirement 51: *Inform where the entered information is saved and how you reach it*. Other changes that emerged through discussion include creating a logo for the tool and updating the visual design of the progress bar and home page, seen in Figure 5.27. To support users with low digital maturity and communicate that the process is intended to take time, a popup was added when opening the tool for the first time, along with a button to reopen it, explaining how the tool works through both text and a short video. From the final summary, users can also return to the home page and reopen the summary if needed.



Figure 5.26: Tutorial popup on the Home page



Figure 5.27: Home page with logo and new progress bar

The refined prototype represents a design result shaped directly by empirical findings. Each change addresses a specific identified need such as greater interface clarity for users with low digital maturity, more accessible information for users without dedicated circular expertise, and stronger visual affordance for users unfamiliar with schematic digital tools. [29, 48].

5.4 Expert Phase

The fourth and final phase constituted a focused *Discover-Define* phase directed at expert evaluation. This phase aimed to gather perspectives from experts in interaction design to identify areas for improvements and future development. The findings were compiled and reviewed alongside the existing requirements and guidelines to form the basis for future work recommendations.

5.4.1 Discover and Define through Expert Tests

To complement the user-centered perspective gathered in the third phase, the finalized prototype was evaluated by experts in the field of interaction design. Expert evaluation provides insights into aspects of usability and design quality that users may not be well-positioned to assess, and input from others within the field is considered important for identifying issues beyond the scope of the user tests, described in Chapter 4.2.4.

Two physical sessions were conducted following the same scenario and tasks as the initial usability test, to ensure comparability, which can be read in Appendix O. There were three participants in two sessions, where the first session was conducted as a group usability test, which encouraged discussion and reflection between the participants, generating richer and more nuanced insights than individual sessions alone as discussed in Chapter 4.2.3. The second session was an individual test to remove bias within a group and here an undisturbed individual opinion. The experts were recruited through convenience sampling, as they were accessible within the project's academic environment and held relevant expertise in interaction design. The sessions followed the same task structure as the user tests, with questions adapted to reflect a design and usability perspective rather than the domain knowledge of the furniture industry. Both sessions were recorded with screen and audio captured separately. The recordings were again transcribed by using Klang.ai.

Rather than applying a full thematic analysis, the findings were organized directly into categories covering suggested changes, identified strengths, and points of ambiguity in the tool. Klang.ai's built-in analysis was applied to identify patterns and points of interest across the sessions. The transcriptions and analysis, together with notes taken during and after each session, formed the basis for the subsequent define phase. This approach was considered sufficient given that the primary purpose of this phase is to inform future work rather than to produce new requirements for the current prototype.

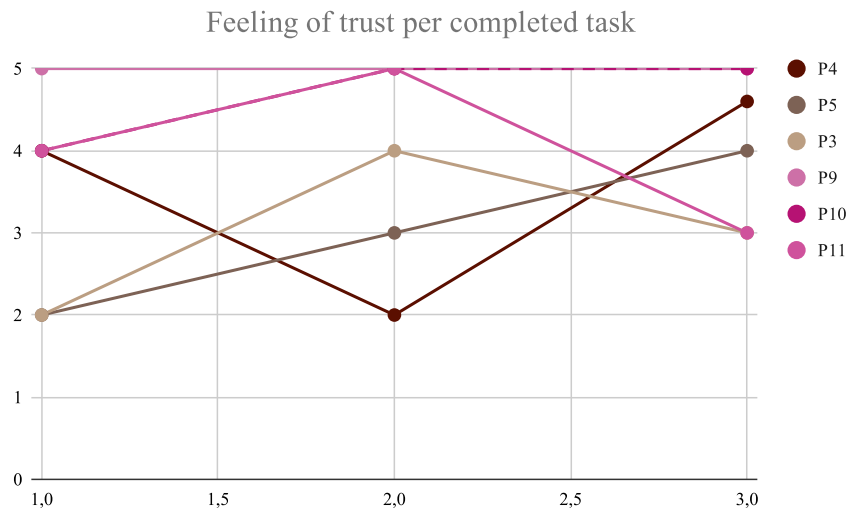
The documented findings were gathered in a compiled list separately to the previously identified requirements and guidelines, available in Appendix S. Collectively they were reviewed to reflect what has and has not been fulfilled in the finalized prototype. This served as the basis for the final refinements of the prototype and future work recommendations presented in Chapter 7.4.

5.4.2 Task Performance and Design Observations

Drawing on both sessions, the following observations capture the design and usability insights that emerged. Unlike the previous phase, clicks and time were not measured since the goal was to gain design insights rather than flow or functions. But, trust ratings were collected in the same manner, with results from both phases presented in Table 5.5.

Both sessions revealed a shared set of initial challenges related to navigation and interface hierarchy. Participants frequently encountered uncertainty around the distinction between the two navigation options, the "Fortsätt" (Continue) button and the step-by-step navigation, describing them as appearing to perform the same function. One participant summarized the experience as: *"Continue and go to step seem to do the same thing"*. The information overlays were another recurring point of friction, with participants noting that opening multiple overlays created a sense of navigating through several nested layers simultaneously, and that scrolling within pop-up windows felt unintuitive. The task where they change the value chain also experienced difficulties in hierarchy where the inactive value chain felt important and like it needed attention in the same heaviness as the editable one. These observations

Table 5.5: Experienced trust expressed by the experts and initial participants after each executed usability task 1,2 and 3



reflect core usability dimensions described by Nielsen [42], particularly learnability and error prevention, where unclear affordances and navigation structures increase cognitive load and reduce task efficiency.

The progress bar generated mixed responses. While participants appreciated the linear structure it communicated, several found the color coding and the connection between the progress bar and the content below it unclear. One participant expressed a desire for a dashboard-style interaction where each step in the progress bar could be clicked directly, and noted that the color used to indicate the active step did not clearly signal editability. Another suggested that the previous and next navigation buttons would feel more logically connected if placed closer to the progress bar rather than lower on the page. This aligns with Cooper et al. [45], who emphasize that established layout conventions and consistent placement of navigational elements are prerequisites for intuitive use and reduced ambiguity.

In the strategy task, the percentage indicator was again misunderstood, consistent with findings from the initial usability tests, with participants guessing it reflected environmental impact or resource savings rather than strategic fit. Participants suggested that this information should be more prominently explained, either through labeling or a highlighted tool tip. The comparison function was generally appreciated, but participants proposed that selecting strategies for comparison could be made more intuitive by allowing users to highlight multiple strategies and then trigger the comparison with a single button, rather than activating comparison mode per strategy individually.

The last usability task was experienced as the clearest of the three, with participants finding the CBMC interaction straightforward once discovered. The red warning notification indicating that a change in the CBMC required attention in earlier tasks as well as when finalizing the business model was described as effective and appropri-

ately prominent. Although, one participant expressed the want to be able to change the business model after finalizing it, saying *"Why can't I change it afterwards? Isn't it my business model?"*. The final summary was positively received overall, with one participant noting: *"I see the vision - it holds your hand"*, and another appreciating that the percentage match gave a sense of continuity across the steps. Concerns were raised about information density in earlier steps, with participants suggesting that the most critical information should be surfaced first and additional detail made accessible on demand. This reflects the principle described by Interaction Design Foundation [41] that interfaces should reduce cognitive load by surfacing the most relevant information first, with additional detail accessible on demand rather than presented simultaneously. These observations informed the final stage of ideation and the changes carried out in the prototype.

5.4.3 Develop and Deliver of Finalized Prototype

The last stage of ideation were based on the findings from the expert tests, where each finding was discussed and decided upon depending on possibility to do within the time frame. In this modified version of brainstorming, no set time was used, as in the third develop stage. Ideas were compared and decided upon in regards of which would mean the most consistency with the interface at the same time it matched the findings.

To preserve the tested prototype, a new file was created in Figma as a copy of the initial high-fidelity prototype. All refinements were developed within this copy. The high-level changes were made in components outside of the frames to ensure the same changes on all frames through minimum time and effort. For low-level changes, each frame was reviewed and the generated changes were made, regarding both visual elements and informational content. This prototype became the finalized prototype, constituting the primary deliverable of the project. Its fidelity is of the same level as the initial high-fidelity prototype. All frames from the final prototype are available in Appendix J. The finalized prototype is presented in the following chapter alongside the study's empirical contributions.

6

Results

This chapter presents the results regarding the research questions for this study. The main research question is:

What value can a digital tool provide in supporting furniture SMEs to develop more circular business models?

And its subordinate questions are:

- *What needs and demands emerge when supporting furniture SMEs in understanding and planning circular business models?*
- *What potential effects can an interaction design process have on furniture SMEs, and on their understanding of developing more circular business models?*

They have emerged from the methods explained in the previous chapter and will now be presented first regarding the initial subordinate question, and then the latter with showing the resulting prototype for the digital tool. The study thus provides two interrelated contributions. The first is empirical: a set of needs and demands that emerge when furniture SMEs engage with circular business model development, grounded in the contextual and usability phases and operationalized as requirements and guidelines. The second is a design contribution: the digital tool Cirkulärvägen, which translates these demands into a structured, interactive artifact. Together, these contributions respond to the research question by demonstrating both what SMEs require and how interaction design can address those requirements in practice.

A recurring theme across both contributions is digital maturity. As noted by Rizos et al. [3], MEs often exhibit limited digital experience, which places particular demands on how tools are structured, communicated, and scaffolded. This was reflected in the empirical findings and explicitly expressed in the usability tests, which shaped central design decisions throughout the development process. The iterative design process itself constitutes a methodological contribution: by grounding each design decision in empirically identified needs and evaluating them with users and experts, the study demonstrates how Research through Design can generate knowledge about both the tool and its intended users [33].

The requirements and guidelines are all displayed in appendices in three formats: from the interviews and literature study in Appendix B, from the usability tests in Appendix H, and all of them incorporated and combined in Appendix K. All interview and usability test data were collected in Swedish. Quotations presented in this chapter have been translated into English by the authors.

6.1 What Are Interaction Design Considerations to Support SMEs in Circularity?

The interview responses from the Contextual phase were compiled and analyzed through a KJ analysis, where recurring insights and patterns were clustered into categories and subcategories presented in Appendix A. These were then translated into requirements and guidelines together with findings from the literature study in the first phase. The complete list of 40 main requirements and guidelines, including 172 subrequirements and subguidelines in total, is presented in Appendix B. This formed the basis for the continued ideation and development of the proposed digital tool. The insights from the six areas discussed in the interviews will now be presented.

6.1.1 Including Needs for Digital and Analogue Practices

The interviews showed that participants already use digital tools in their everyday operations. However, these are primarily administrative and fragmented systems rather than tools supporting strategic development as the fragmented digital environments mentioned above. No participant described using a dedicated tool for developing circular business models. This is consistent with Szopinski et al. [30], who identifies that despite the potential of software-based business model tools, the space remains underdeveloped and no existing tool provides all functions practitioners require.

At the same time, several participants expressed a need for more integrated digital support. However, they also highlighted a key challenge: such a tool must balance being sufficiently specific to create real value, while still being adaptable across different SMEs. This tension is further reflected in current practices, where some companies have developed their own internal frameworks for circular work. While these demonstrate increasing awareness and ambition, they are inherently tailored to individual contexts and therefore lack transferability to a broader set of companies.

These findings generated the KJ category *They want a digital tool*, including subcategories such as *It needs to be adaptable to different companies*. As Fritscher and Pigneur [29] note, digital tools address limitations of static formats by enabling users to track changes and work with their model over time – a function participants here described as absent from their current digital environments. Together, this suggests that digital support should not replace existing practices, but rather integrate with them and support both digital and analogue ways of working.

6.1.2 Supporting Flexibility in Use of Tool

Regarding the participants roles, the interviews showed that responsibilities often varied greatly and were generally broad in scope. This was especially evident among SMEs, where limited organizational capacity often prevents the distribution of tasks across multiple specialized roles. Instead, responsibilities related to sustainability, circularity, operations, and business development were often combined within already existing positions. This finding aligns with Rizos et al. [3], who identify limited internal capacity as a central barrier to circular transition in SMEs, and points to a design implication: the tool must function across a wide range of competencies and roles rather than assuming a dedicated sustainability function.

For example, one participant described themselves as being *"The spider in the web"* for being responsible for sustainability coordination while simultaneously handling regulations, supply chain matters, and sales responsibilities. Another participant expressed *"I'm a bit of a Jack-of-all-trades, I have environment and you name it on my table"* when they explained that their role included sustainability, certifications, quality management, work environment responsibilities, and involvement in product development, while also noting that their daily tasks varied significantly. This suggests that work related to circular transition is rarely assigned to dedicated positions within SMEs, but rather integrated into already demanding existing roles. As P1 expressed: *"But for me it's broad so it can vary a lot from day to day depending on what you're working on."* This indicates the need for a broad and flexible design approach that supports multiple overlapping responsibilities rather than a single specialized role, consistent with Rogers et al. [35]'s emphasis on designing for the varied contexts and behaviors users bring to a system, and with Goldman et al. [37]'s argument that tools in organizational settings must mediate across different ways of understanding and enacting work.

These findings generated several categories in the KJ analysis such as *Competence is a limited factor*, since dedicated roles are lacking, and *Time is a limited factor*. These in turn informed demands of needing to fit within an already full workday, such as requirement 23: *Demand little time of the company's everyday work* and the lack of competency influenced guidelines such as Guideline 21: *Support SMEs*.

6.1.3 Supporting Additional Business Models

One of the most prominent findings concerned how companies currently work with circularity. Across participants, CBMs were generally described as secondary initiatives operating alongside the primary linear business model, rather than replacing it. This aligns with how Fritscher and Pigneur [29] highlights smaller strategic adjustments rather than a redesign, as presented in Chapter 2.3.3. This resulted in a category within the KJ analysis of *They see CBM as a side track*, where several participants expressed that circular initiatives were pursued cautiously and gradually rather than through a complete strategic shift. One participant described the process as more of a journey than an active decision that they have made. This affects how the tool should present the process and resulted in requirement 34: *Focus on adding an additional business model instead of a full switch*.

Another important insight was that circularity was often practiced operationally rather than strategically. Examples included refurbishment of furniture, use of spare parts, modular solutions, repairability, and extending product lifetimes. However, these practices had often evolved organically rather than through structured circular business model planning. This suggests that many companies are already engaging in circular activities, but without formalizing them into coherent business model strategies. This influenced three categories in the KJ analysis, e.g. *To change business model is a complex process*, which informed requirement 18: *Make process of CBM development easily followed* with its subrequirements 18.1: *Include stepwise transition structure* and 18.2: *Show progression in development of CBM* for clarity. Other KJ categories emerging from these responses were *They have difficulties handling the practical parts after transitioning*, *They need systematics*. They informed requirements such as 5: *Enable understanding of the practical work of the new business model* and 19: *Encourage systematized production structure*.

In addition, the interviews showed variation in circular maturity levels. Some companies had progressed relatively far and were already discussing digital product passports, reverse flows, and remanufacturing. However, even among more mature participants, systematization was lacking. This enforced requirement 19: *Encourage systematized production structure*

These findings align with Szopinski et al. [30], who identifies that no existing digital tool fully addresses the range of functions practitioners need when developing business models, and with Nikolic and Dahlberg [48], who highlight that SMEs require tools that are immediately actionable rather than conceptually oriented. The patterns identified here, of circular activities already present but not formalized, reflect the gap these authors describe, and contribute empirical grounding to needs and demands.

6.1.4 Assisting Transition to a New Business Model

When discussing business model change, many participants described the process as abstract, complex, and difficult to understand. Existing organizations were deeply adapted to linear production and sales logics, making alternative models difficult to imagine in practical terms. One participant explicitly stated that *"I think it is ingrained, that you are stuck with the linear"*, and this leads to companies struggle to understand how another model would actually function. This influenced the KJ analysis category *To change business model is a complex process*.

Several participants also emphasized the importance of external inspiration. Industry seminars, hearing how others had worked, and examples from other sectors were described as valuable triggers for new thinking. This directly shaped the KJ category of *Appreciating new perspectives* and then informed requirement 25: *Get examples and inspiration of others' transitions*. Another recurring need was to start from the current situation rather than from theory, aligning with the framework provided explained in Chapter 2.3.4. Participants wanted to understand their existing business model first before discussing future alternatives. This formed the subcategory of *There are always ways of improvement and potential* and informed the requirement

22: *Development process should stem from the current business model*. Participants also described change as something that requires time. Circular transformation was not seen as a quick fix, but as a process requiring iteration, learning, and organizational adaptation. This resulted in the subcategory *It takes time switching ways of working* and requirement 24: *Comply to process needing time to be realized*.

These patterns collectively reflect what Goldman et al. [37] describes in Chapter 3 as the mediating role of design in organizational change contexts, where tools must support not only task completion but shifts in how practitioners understand their situation. The need to ground the process in the current business model, access external examples, and accommodate gradual change over time together constitute a set of cognitive and organizational demands that extend beyond resource constraints alone. These demands add to the picture of what supporting furniture SMEs in understanding and planning circular business models requires in practice.

6.1.5 Identifying Main Barriers for Transition

The interviews revealed several practical barriers that limit circular business model implementation. Participants repeatedly highlighted lack of time, limited competence, and constrained financial resources. SMEs often lack the ability to dedicate staff exclusively to transition work, and hiring consultants may feel costly or reduce internal ownership of the process. This reflects what Rizos et al. [3] identify as key implementation barriers among SMEs, where limited staff capacity and financial constraints consistently prevent dedicated circular transition work. These findings informed requirement 23: *Demand little time of the company's everyday work*.

Another major challenge concerned compliance requirements such as ISO systems, Möbelfakta, EPDs, and upcoming digital product passports. Participants described administration and documentation as highly resource-intensive. This was reflected in the KJ category *Regulations and certificates are helpful towards circularity* and its subcategory *Regulations and certificates demand a lot of work*. This led to the formation of requirement clusters such as Requirement 7: *Include connections to regulations relevant for the chosen strategy* with its subrequirements regarding specific regulations and certificates.

Participants also expressed uncertainty regarding reverse logistics, furniture returns, quality inspection, staffing, and planning. This shaped the KJ category of *Difficulties with handling practical work after transitioning* with its subcategories *Difficulties handling logistics* and *Wants to understand the needed manpower*. These then informed subrequirements of requirement 5: *Enable understanding of the practical work of the new business model* such as 5.1: *Enable structuring of logistics depending on chosen strategy*, 5.3: *Inform of needed logistics*, and 5.4: *Inform of needed manpower*.

Many companies described fragmented digital environments involving Excel sheets, folders, disconnected systems, and manual routines. From this, the KJ category *Businesses use different systems* was formed. From this, the understanding and informing of Requirement 40 came: *Adaptable to different digital systems* and its

subrequirements of specific systems.

Finally, several participants described uncertainty regarding profitability and return on investment when developing circular offers. From this, both the category *SMEs have more difficulty with money* and *They feel uncertainty for new business models* could be identified, leading to requirement 26.1: *Present economic effect of new business model to the company*.

These combined barriers align with Nikolic and Dahlberg [48], who highlight that furniture SMEs specifically face difficulties translating circular economy principles into concrete action due to limited internal expertise and scarce resources, contributing empirical specificity to what that challenge looks like in practice.

6.1.6 Needs for Structured and Accessible Support

The final interview theme focused on what kind of support a digital tool could realistically provide. Initially, participants described a need for help in understanding which parts of the business model could be changed and how those changes affect the overall company. These formed the KJ category *To change business model is a complex process* and shaped requirements such as Requirement 18: *Make process of CBM development easily followed*.

It was clear from the interviews that the participants appreciated examples, strategic alternatives, and visual overviews of circular opportunities. This directly influence the category *They appreciate new perspectives* and its subcategory *They get inspired from others' CBMs* which informed requirements such as 25: *Get examples and inspiration of others' transitions*. A recurring request was support in understanding the financial consequences of a new model. This became a part of the KJ category *SMEs have more difficulty with money* and from that, requirements such as 26: *Bring an understanding why it's worth it for the business* could be derived.

Besides what a digital tool could bring them in this process, many also expressed what they needed the tool to be. They made it clear that any support tool must feel credible, serious, and relevant to real business conditions. This informed the *They want a digital tool* and then Guideline 3: *Ensure feeling of trust* and its subguideline 3.1: *Show respect to the reality of the business*, and 3.3: *Ensure feeling of trust for the new business model within the business* and its subrequirement 3.2: *Include transparent and clear explanations*. Informing the same KJ category, is the tool needing to offer realistic use in everyday work. They want a tool that could be used asynchronously, gradually, and without disrupting daily operations, informing requirements such as 23: *Demand little time of the company's everyday work*.

Taken together, the needs and demands identified in this phase constitute the first primary result of the study. They demonstrate that the challenge for furniture SMEs is not a lack of circular ambition, but a lack of structured, accessible support for translating that ambition into a coherent business model - a gap that interaction design, through user-centered tool development, is well positioned to address[30, 37].

The requirements and guidelines were prioritized through a MoSCoW analysis. Those expressed by the majority of the participants, through the scope by CirkuTrä and RE:Furn, e.g. regarding the framework, or clearly expressed from the literature study, became 'Must Haves'. The ones expressed by only a few became 'Should Haves' and the ones which were either expressed by only one participant, or would potentially be outside of the study's possibilities became 'Could Haves'. Lastly, the ones outside of the scope or time frame available became 'Won't Haves'. They are still documented to build upon for future work but will not be addressed in the further development within this study.

6.2 Five Identified Design and Usability Themes

Navigation and hierarchy captured recurring confusion around multiple ways of performing the same action, unclear distinctions between navigation levels, and the disconnect between the progress bar and the content it represented. These findings reinforced requirements around navigation clarity and consistency already identified in the third phase, and added new suggestions around progress bar interactivity and color-coded hierarchy. As Cooper et al. [45] describe, consistent navigation structures and clear visual hierarchy are foundational to usable interfaces, and their absence places additional interpretive burden on the user.

Visual design and feedback covered a range of observations about borders, shadows, color use, and spacing. Participants noted that borders and strokes were used extensively throughout the interface, in some cases creating visual noise rather than clarity. The use of red as a warning color in the confirmation dialog generated differing opinions among participants. One found it suggestive of an error rather than a deliberate action, while others responded positively - noting that the red border felt appropriately serious given the importance of the step, and that it effectively signaled that something had changed. One participant summarized the visual overload more broadly, noting that the interface felt like "*a page within a page within a page*", pointing to a general need to reduce layering and visual complexity throughout. Recommendations to resolve this included more selective use of borders, clearer color coding to indicate belonging and hierarchy, and shadow styles that better differentiate interactive cards from static content.

Information presentation reflected a tension between the amount of information needed for the tool's purpose and the cognitive load it places on first-time users. Participants acknowledged that much of the text was necessary given the target group, but suggested prioritizing the most important content visually, for example through color-coding descriptions, examples, and instructions differently, and allowing users to expand details on demand rather than presenting everything at once. The information overlays were noted as valuable in principle but potentially overloaded in practice. This tension is recognized in interaction design literature, where Rogers et al. [35] note that interfaces must balance completeness of information with cognitive load, particularly for users with limited prior experience of the system or its domain.

Methodology and trust captured participants' interest in understanding the tool's underlying basis. Several participants noted that they would want to know what the tool's recommendations are grounded in, and suggested that making the methodological foundation more visible, for example through source references in the output, would increase trust in the results. While an explanation of the 10R framework was already present in the tool's information texts, this finding suggests it was not sufficiently visible or discoverable, pointing to a need for clearer signposting of existing methodological content rather than solely adding new information. This reflects Nikolic and Dahlberg [48], who highlight that SMEs require tools that feel immediately credible and grounded in real business conditions - a demand that extends beyond interface clarity to the perceived legitimacy of the tool's content and recommendations.

Strengths of the current design were also documented. Participants highlighted the intuitiveness of the value chain editing once the function was located, the effectiveness of the red warning when changing from the CBMC step, the clarity of the final summary despite its length, and the overall sense that the tool's structure and purpose became clear after a few steps. One participant noted that the reuse of visualizations across steps created continuity and helped orient them within the process.

Across the five themes, a consistent picture emerges: the demands placed on this tool extend beyond functional completeness to the way information is structured, communicated, and made trustworthy. This is consistent with what Goldman et al. [37] describes as the mediating role of interaction design in organizational change contexts - the tool does not merely deliver content, but shapes how practitioners understand and engage with the process of circular business model development. The expert evaluation therefore contributes not only design refinements, but empirical evidence of what interaction design must address when supporting SMEs with limited digital maturity and scarce internal expertise.

6.3 Initial High-Fidelity Prototype

The initial high-fidelity (hi-fi) prototype was developed in Figma as the first fully visual representation of the tool. It further refines visual clarity and hierarchy, interaction design, feedback mechanisms, and representation of inputs and outputs compared to the low-fidelity (lo-fi) version. Using the prototype takes you through CirkuTrä's and RE:Furn's framework, presented in Chapter 2.3.4, but in a digital form. All frames are available in Appendix F. The aim was to create a more realistic representation of the tool and how it would be experienced by users. The following sections describe the key design decisions and interface elements introduced in this prototype. It was later refined in two iterations, these frames are available in Appendix I from the refined prototype and Appendix 6.5 from the final prototype.

The visual design was refined through the introduction of a consistent color palette, typography system, and visual hierarchy. Colors were assigned functional roles to distinguish actions, information, and feedback, supporting readability and clarity

according to Material Design [44] introduced in Chapter 3.2.1. The color palette was influenced by the target group being the furniture industry, where raw material is largely wood. The surface color and accent colors are presented in Figure 6.1 with their component-colors below. They each have an "On"-color for text or icons placed on top of these colors, which each were validated through contrast evaluation for accessibility. Typography was structured to guide user attention and reduce cognitive load following the guidelines of Kennedy [43], but decided upon in a later phase for the final prototype.



Figure 6.1: The surface color and accent colors of the tool, with their component-colors below and color codes respectively

Interface components were further developed and standardized, including buttons, input fields, lists, and selection elements. These components were designed to ensure consistency across the interface and to clearly communicate possible actions to the user in accordance with Guideline 1.2: *High usability*. Besides components, guidance elements were developed to improve clarity, including refined information boxes, clearer instructions, and contextual explanations. This enhances the user's understanding of both the process and the decisions being made. Interaction design was refined by introducing visual feedback for user actions, such as highlighting selections, confirming inputs, and indicating progress. This supports user understanding of system status and reduces uncertainty during the process. Within this, navigation and flow between steps were refined to create a smoother and more intuitive user experience, while maintaining flexibility for users to revisit previous steps without losing progress.

These refinements strengthened the fulfillment of several key requirements, particularly those related to usability, guidance, trust, and clarity, such as Requirement 6: *Offer guidance in the process of developing a new CBM*, Requirement 9.1: *Include visual change feedback in business model canvas(add/change/remove)*, and Guideline 2.2: *Facilitate identifying of future circular strategy as a second step of the development process*. The refined visual design also contributed to a stronger sense of credibility and trust, which was identified as important in the requirements. The hi-fi prototype enabled a more realistic representation of the final tool, allowing evaluation of the user experience in a context closer to actual use. The refined and finalized versions of this prototype are presented in the following section.

6.4 Final Prototype from the Fourth Iteration

Based on the expert evaluation, a selection of changes from the refined prototype, described in Chapter 5.3.6, were identified as candidates for implementation within the project's remaining time. These focused on adjustments that were both high impact and feasible to implement at the prototype level - primarily addressing visual design issues and interaction clarity that had been consistently raised across both the usability tests and the expert sessions. The resulting prototype became the finalized prototype and constitutes the primary deliverable of the project. All frames from this prototype are available in Appendix J.

Several changes were made to clarify the navigational structure and visual hierarchy of the tool. On the home page, to not confuse which button leads to continuing the process, the buttons within the steps were changed from "Till steg" (To step) to "Översikt" (Overview) to help understand where the interaction will take them, as seen in Figure 6.2, and more detailed in the Appendix. As seen in the middle frame in the same figure, the final navigation button within each step was renamed from "Nästa" (Next) to "Sammanfattning" (Summary) to more clearly communicate the destination. When reaching the summary, what the next step entails is described in text to communicate what continuing will lead to. This is presented in the right frame in Figure 6.2.



Figure 6.2: The home page with final progress bar, the last task of one step showcasing the updated button, as well as a summary showing updated text for continuation

The grouping of overview cards in Step 1 and 2 was given the labels "Nutidsanalys" (Current state analysis) and "Strategiska förutsättningar" (Strategic preconditions) as shared labels, connecting the cards to their collective purpose. This is shown in Figure 6.3 where it is also evident that the stroke previously surrounding these cards was removed as a result from the visual design and feedback theme. Instead, the three cards were brought closer together with a shared background color to communicate grouping without implying differing levels of importance. The right frame in the same figure shows Step 4, where the list sorting function was moved to within the customer segment to clarify grouping and hierarchy. Typographic hierarchy was also updated through revised title fonts to better distinguish levels of content throughout the interface. The typography was reviewed and updated, where the fonts and their usage is presented in Figure 6.4.

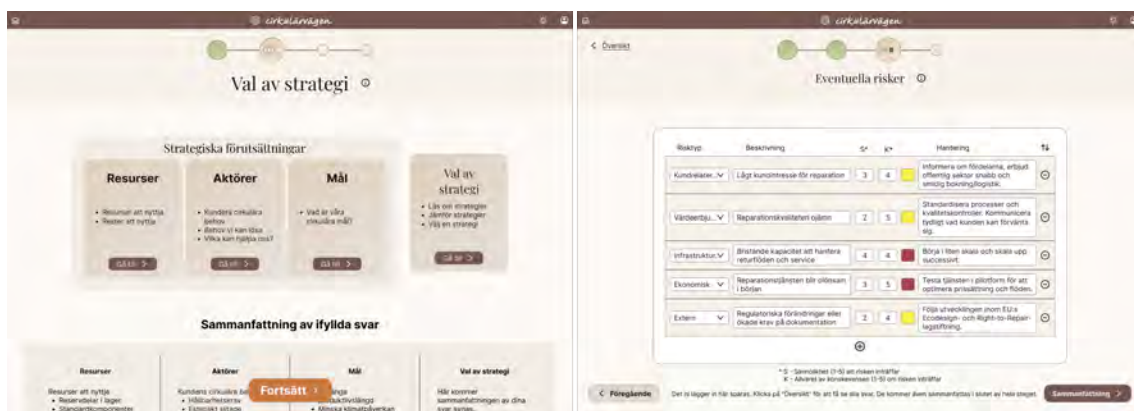


Figure 6.3: The overview of the final prototype showing the updated grouping of tasks, as well as the moved icon for sorting within a list

Header	• Playfair Display • Regular • 48 px	Title of current step	Default	• Inter • Regular • 18 px	Regular text
Title	• Inter • Bold • 30 px	Title within current task	DefaultBold	• Inter • Bold • 18 px	Title of regular text
TitleSemi	• Playfair Display • Regular • 30 px	Title of current task	Secondary	• Inter • Regular • 16 px	Less prominent text
			SecondaryBold	• Inter • Bold • 16 px	Highlighted less prominent text

Figure 6.4: The final typography and their use within the tool

To help users understand where they are in the process, cards within the overview now change to green, instead of staying the same, when completed as presented in the overview after completing the first task in the first step in Figure 6.5. This connects the overview state to the progress bar shown within each step. In the overview and summary screens, new or updated entries are written in green to distinguish them from previously entered content. The entries are also grouped to the specific question they regard from the task within each theme. Both these changes are presented in the right frame in Figure 6.5 and represents the same changes in the summaries. These changes address the need for clear, continuous feedback on task completion and progression identified during the expert tests.

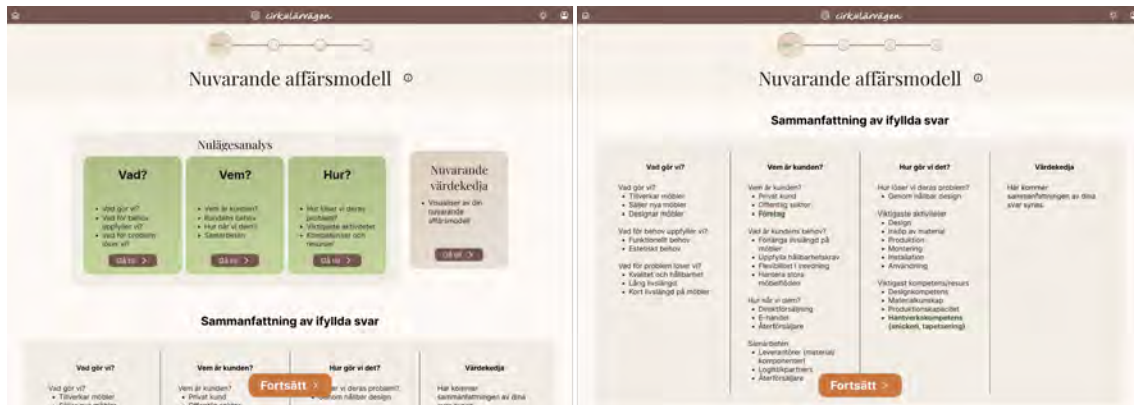


Figure 6.5: The overview when completed the first tasks in a step, as well as the listed entries in the overview showing the hierarchy and feedback of new entries

Information pop-ups were standardized to a consistent size with expandable preview text, reducing the amount of content shown by default to adhere to the emerged theme of information presentation. This is presented in Figure 6.6 together with the text segments of the final summary where the same principle was applied. Text sections were restructured to show a preview by default with the option to expand, keeping full content accessible while reducing immediate cognitive load. The same figure shows how information overlays without clickable functionality had their shadows removed in the final summary. This was to better communicate their non-interactive nature. This is a result of the theme regarding visual design and feedback.

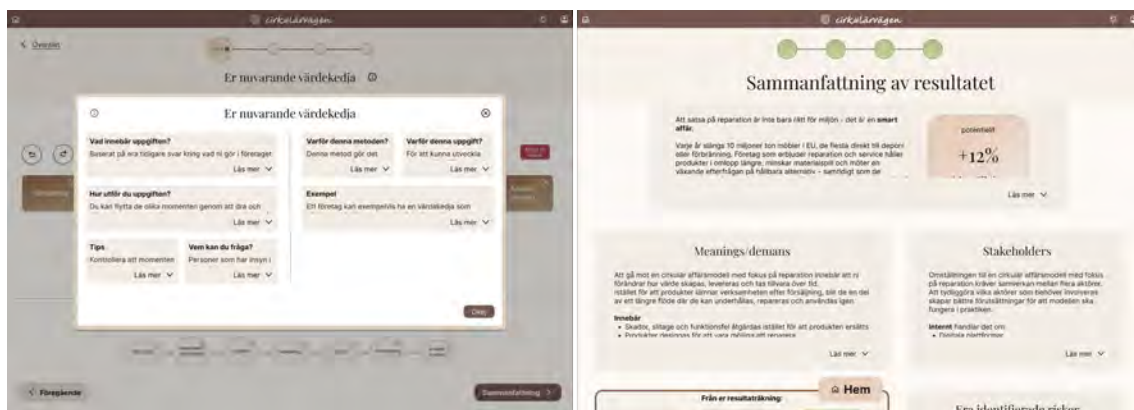


Figure 6.6: The informational pop-up and final summary with collapsed text segments

Several changes addressed consistency and the clarity of interactive elements. The visual distinction between clickable and non-clickable information icons was clarified through a color change visible in the top left corner of the information pop-up in Figure 6.6. The fact icon on the home page was updated accordingly. Within the carousels of Task 1 in Step 1 and 2, the information icon was moved to sit directly next to the card title, consistent with its placement next to the task and step title elsewhere, as presented in Figure 6.7. The second task of the first step is shown in the same figure where the users are able to edit the generated value chain. In

this, the original value chain visualization was made visually smaller to reduce its prominence relative to the editable version, and a hover state was added to its information icon to clarify its purpose and distinguish it from clickable information icons elsewhere in the interface.



Figure 6.7: The first task of the first and second step showcasing movement of icons, as well as the editing of the value chain in the first step

The full set of findings from the Expert phase, including those not addressed in the current prototype, are documented as recommendations for future development in Chapter 7.4. Alongside this, the existing requirements and guidelines were reviewed collectively to reflect what has and has not been fulfilled in the finalized prototype, a list of which ones are fulfilled is presented in Appendix T.

6.5 Overview of the Final Prototype

The finalized prototype is a high-fidelity, interactive web application prototype developed in Figma. It guides furniture SMEs through a four-step process for developing a new circular business model, built upon the framework from CirkuTrä and RE:Furn. The prototype supports input, decision-making, and reflection at each step, and generates a circular business model canvas as its primary output. In this chapter, the structure and flow of the final prototype is presented together with supporting figures of its frames. They represent an overview of the tool's main screens and overall visual design. How it has developed throughout the iteration with design decisions, and its grounding in the identified requirements and guidelines, is presented in the sections below. All frames are available in Appendix J.

The **home page** is the initial landing page, as presented in Figure 6.8. It includes the progress bar which is consistent throughout the tool and has navigational functions. Besides this, the user can scroll downwards where it provides motivation and information to support learning about circularity through time-based swap between facts. At the bottom, a carousel of examples are presented where the user themselves can flip through different examples of others' transitions for inspiration. The first time the user reaches a new overview or task, they are presented with an informational pop-up explaining different aspects of the coming frame, e.g. how to execute it and why it is important.



Figure 6.8: Home page of the tool when the first step is done, and the second active

When initiating the process with the **first step**, defining their current business model, the user is presented with the overview of the tasks within the step displayed as cards as seen in the first frame in Figure 6.9. This also includes a summary of already entered data at the bottom. From here they can navigate to specific steps or continue where they left of. The frame to the right in the figure is the summary when completed the first step, showing a visualization of their value chain from the tasks within the step.

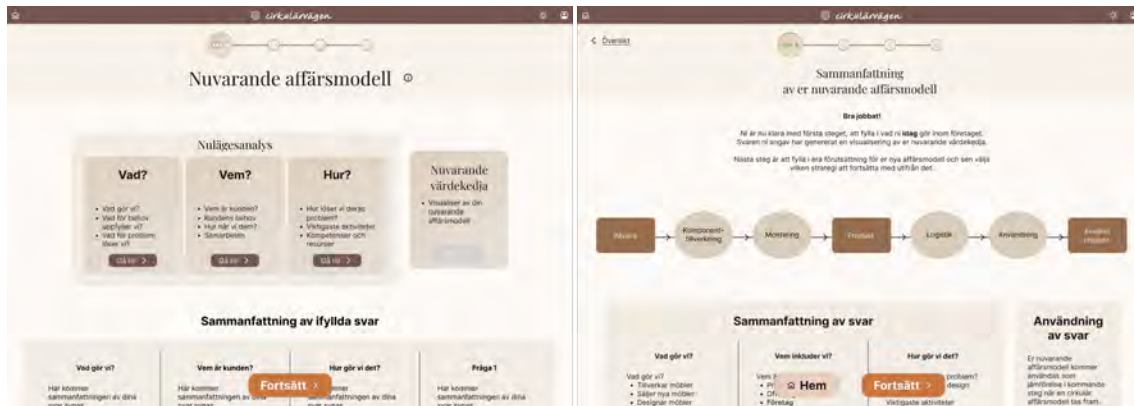


Figure 6.9: Overview and summary of the first step

Figure 6.10 shows the tasks within the first step. Initially they enter data through a carousel replying to the "What?", "Who?" and "How?" questions from CirkuTrä and RE:Furn's framework in Chapter 2.3.4. From these entries, a value chain is generated representing their process of work, where the ovals represents stages of the process and the squares represent stages of the product. The second task is to either confirm that this is correct or to make changes in it to make sure it does not show incorrect steps. The changes they can make is to move, copy and paste, remove, or change what they are. They then move on to be presented with the summary as seen in Figure 6.10.



Figure 6.10: The tasks in the first step in the tool

The **second step** is to choose circular strategy to continue with. Again, they are presented with information about the step and then the overview of the tasks within the step, identically to the first step, together with the summary, as seen in Figure

6. Results

6.11. The summary in the end concludes the results from the step, with the chosen strategy and its given information in a scrollable screen with the entries of the tasks in an identical list below as the summary in Figure 6.9. The choice is made in a drop-down in the orange box below the list.

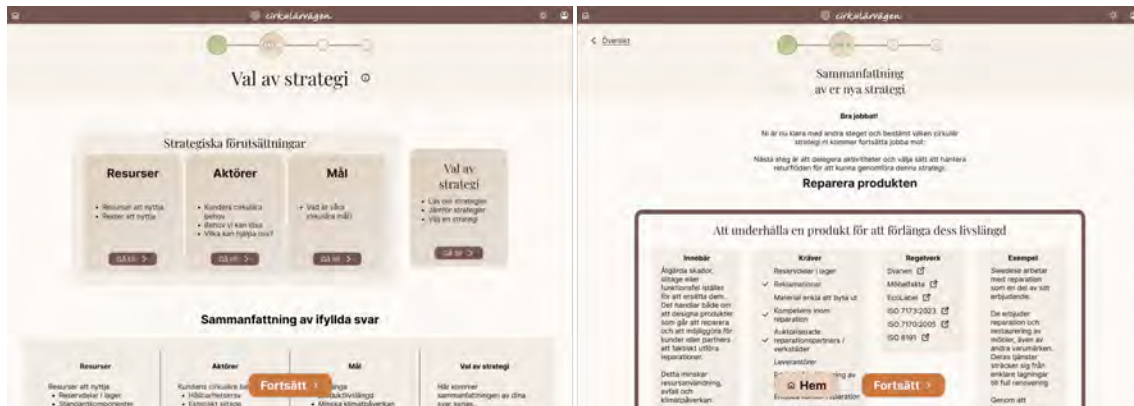


Figure 6.11: Overview and summary of second step

The tasks of this step are presented in 6.12 where the initial task is where they fill out, again through a carousel, their strategic prerequisites for their new business model. The second task is to choose between the different 10R-strategies. They can only choose one of the strategies, and their match based on their prerequisites are presented in the percentage next to the name of the strategies. They can read more about what each strategy means and demands, which regulations they require, and examples from others' transitions by pressing it. They can also compare two strategies through the buttons on the right. Lastly, choose a strategy from a drop-down below, visible when scrolled downwards. When they have made their decision, they move forward to the summary presented above.

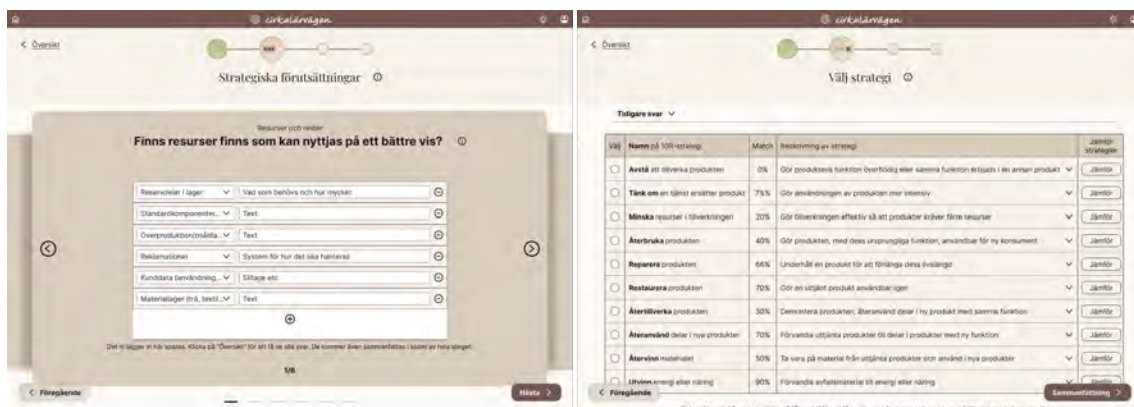


Figure 6.12: Second step in the tool

The flow of the **third step** is the same as the previous ones where they reach an overview with an informational pop-up initially presented as seen in Figure 6.13. This step regards practical work of the new circular business model, to be able to follow the chosen strategy. The overview is different since the step only consists of two tasks, delegating activities and choosing between return flows. In the summary, an updated version of their value chain is presented, with an additional chain incorporated of their new circular activities.

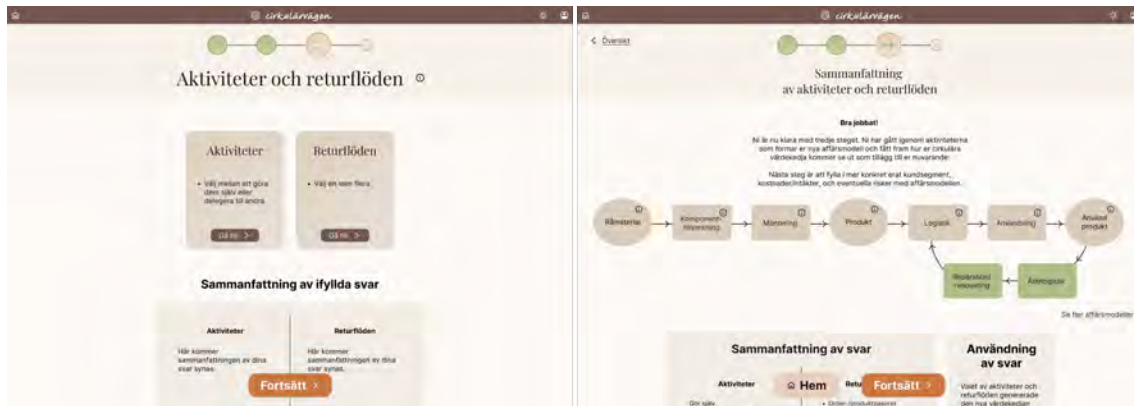


Figure 6.13: Overview and summary of third step

The tasks are presented in 6.14 where they initially choose who to delegate the different activities to. These activities are generated based on chosen strategy and can be read and understood more deeply by pressing. The second task is to choose between different return flows where several options can be chosen simultaneously. When they are delegated and chosen between, the user moves on to the summary showing the updated value chain.

Alternativ till den valda strategin	Välj vem som utför aktiviteten
Returlödslogistik eller andra serviceenheter	
Återvinning	
Reparation	
Distribution	

Välj	Alternativ för returlämnande	Märsk	Beskrivning av returlämnande
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionssamtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionssamtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionssamtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionssamtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionssamtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionssamtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionssamtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionssamtal

Figure 6.14: Third step in the tool

The **fourth step** includes four tasks and its overview and summary is presented in 6.15. The tasks are to define their customer segment, costs and revenues, risks, and lastly review the final CBM though a presentation of a CBMC where their entered and generated results are gathered. The final task works as both the summary and a tasks since it is editable if the user reaches it and finds something they want to change.

6. Results

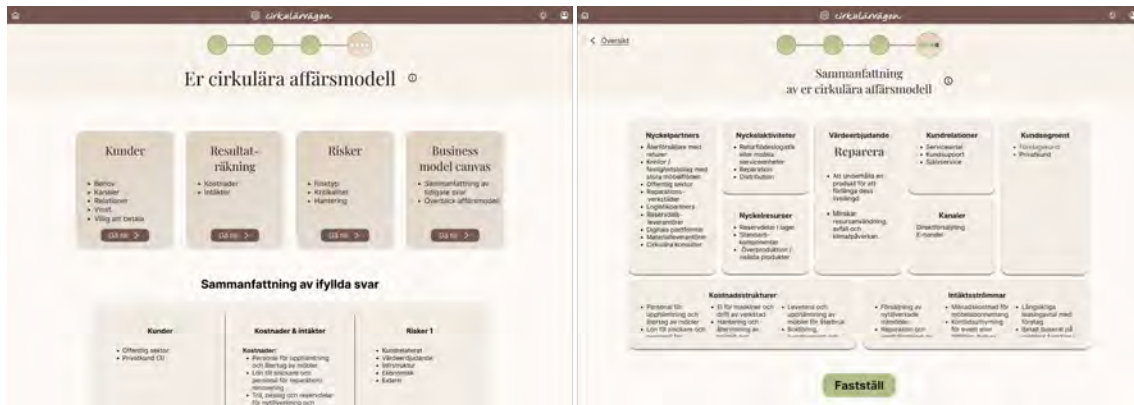


Figure 6.15: Overview and summary of fourth step

In Figure 6.16, the tasks except the CBMC are presented. Initially they enter their customer segment based on the questions CirkuTrä and RE:Furn incorporated in their framework. Secondly, they enter their possible costs and revenues based on their new business model. This task will take time and cooperation between departments to define. Lastly, they enter the possible risks and how to handle them for deeper understanding of practical work. All of these entries, together with entries in previous steps, are summarized and gathered in the CBMC as seen in 6.15.

Figure 6.16: Fourth step in the tool

When deciding to finalize the business model, they are navigated to a final summary of all their results, presented in 6.17. This presents their newly generated value chain, motivation information, practical information, examples and results. When leaving this summary, they can start a new process if wanting to further develop a business model after implementing this one. They can also always reach this summary when wanting to read more.

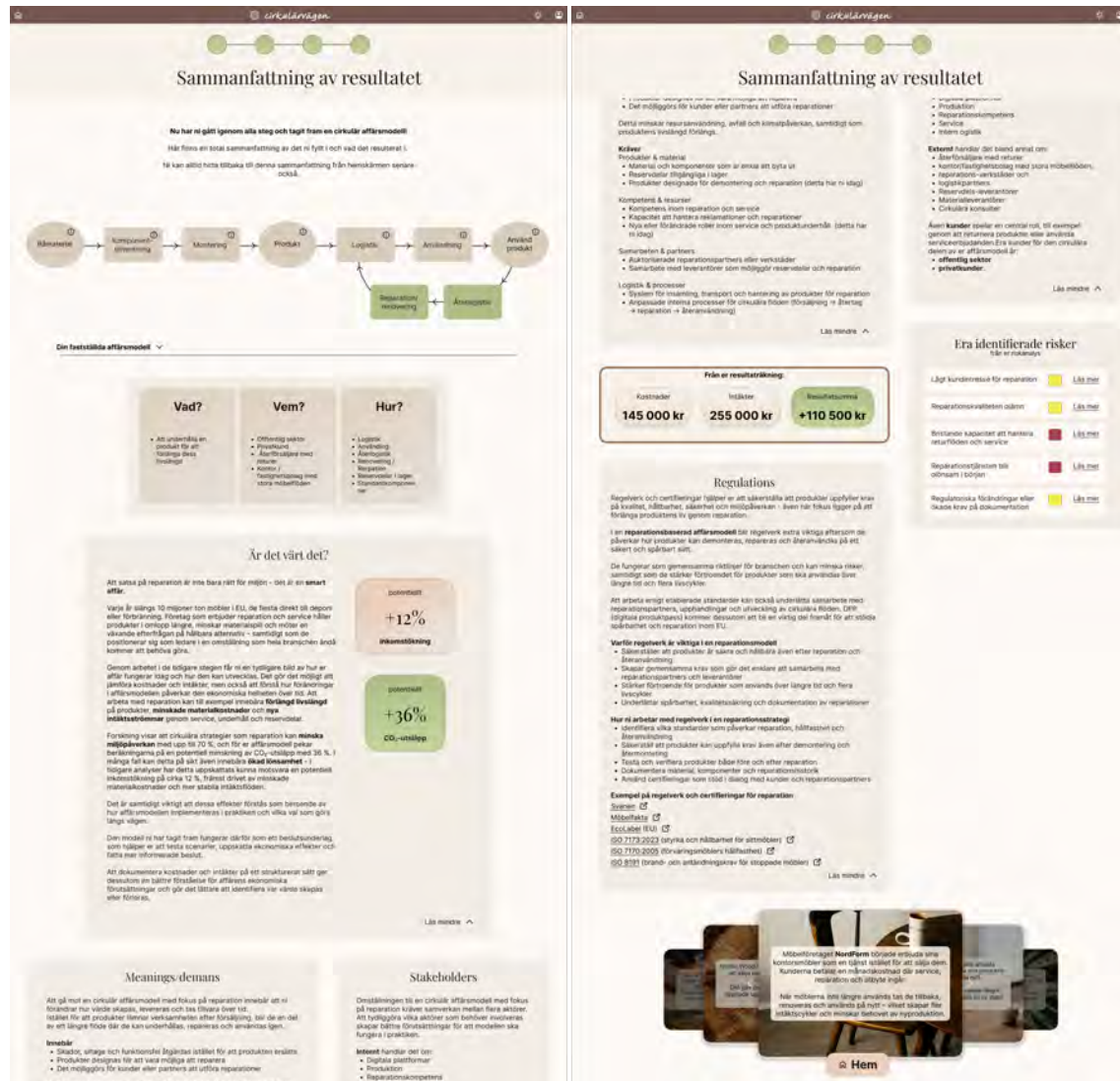


Figure 6.17: Summary of the process with more information, including regulations

Taken together, the empirical findings and the resulting prototype constitute two interrelated contributions to the research question. The needs and demands identified in the contextual phase reveal that furniture SMEs rarely lack circular ambition, but rather the structure and accessible support needed to act on it. The prototype Cirkulärvägen demonstrates one way interaction design can respond to those demands: by formalizing existing circular practices, making strategic choices concrete and comparable, and embedding the process in a guided structure that fits within a constrained workday. How these contributions together answer the research questions is discussed further in Chapter 8.

7

Discussion

The chapter discusses the reflection of the process and results of the study. The process is reflected upon in terms of how methodological choices and collaboration shaped the study's outcomes. The results are then discussed in relation to the research questions, examining what needs furniture SMEs express when developing circular business models, and what value a digital tool can provide in addressing them. Lastly, the future work emerged from the study is presented.

7.1 Discussion of the Process

This study was made by two people during approximately five months. Working through a design process demands large amounts of discussion and cooperation. To ease this form of working, a high priority of structure was made, both to ensure traceability in results as well fair judgment between the pair. A supervisor from Chalmers University of Technology was included in the process to ensure following a reasonable plan and schedule. In addition to this, the research projects CirkuTrä and RE:Furn was represented through a supervisor, enabling full understanding of the scope and framework the study regarded. This included seminars and group meetings with other studies made for the same research projects simultaneously for discussion and inspiration between projects.

The study followed the structure of a *Double Diamond* process in an iterated form where it was repeated in different scales four times. Even though it was a modified structure, it enabled a clear structure of which method would lead to which results, and how to move forward with the results at hand. Results from the different *Discover* phases were handled similarly in the *Define* phases to ensure consistent form of insights. These were then ideated around with a similar documentation of results in the *Develop* phases to directly translated to the prototypes in the *Deliver* phases.

The **Discover** phases gave substantial results regarding the problem area. Initiating with a half Double Diamond with a literature study was essential since it enabled deep understanding of both the context and the user group. Without this, the initial user study of interviews would have risked being irrelevant for the problem at hand and the questions asked could have been too broad and missed important aspects necessary for continuation. Using interviews as the user study in the second iteration proved helpful for the narrowing of the scope and understanding of how

the users viewed the issue. The fact that some interviews were conducted through different scripts and in different formats gave broader understanding, even though less comparable results. The usability tests were helpful in both understanding the problem area deeper and, especially, how the user experienced and expected a digital tool and its interface. This generated more design understanding, which could be tested further through the expert tests with UX designers. To test them in this order, with the users initially followed by designers, enabled the flow being understandable for the users before diving deeper into how the design could be improved. If it would have been the other way around, the design decisions from the expert tests could have been irrelevant if the flow later proved being incorrect and more substantial parts of the interface needed to be modified. These results from the Discover phase gave the base of what the interface turned into.

The results of the Discover phase was handled in the **Define** phase with great structure. As a result from the first iteration, the problem definition as a result made it possible to form the interview to ensure its relevance. From the user studies, initiating with a KJ analysis ensured every transcription being reviewed for relevant insights, where every insight was discussed to guarantee its true meaning emerging and affecting the generated themes. Using a clear list of requirements and guidelines of the translation of the themes and expressions to needs and requirement ensured clear traceability and effect. This simplified the process of describing the results and what they emerged from to ensure objective results throughout the process. All Define phases were handled in this way, where the requirements and guidelines from the first iteration were identified together with the second iteration. The final Define phase followed the same format, though with less structured documentation due to time constraints. Changes requiring further discussion and analysis were identified and documented explicitly, ensuring traceability for continued development in future work.

Based on the results from the Define phase, the ideation of the **Develop** phase had clear mapping of what to ideate regarding and what the concepts needed to fulfill. The one thing that could have simplified traceability further, would be to document which element fulfilled which requirement and guideline directly in their list, instead of separately as it was done. However, the separate list ensured smooth understanding of which elements regarded different frames and clustered them in relevance for the later prototyping. Initiating with mindmapping regarding structure and layout ensured consensus in understanding the ideas where larger changes were made. This stage was where most design elements were decided, which was simplified with the use of sketching instead of only discussing and explaining. In later iterations, when smaller changes needed to be made, using methods closer to brainstorming ensured effective results without needing the visual representation to convey an idea. These stages and the documented results made it easy to understand the fulfillment of requirements and guidelines as well as the continuation of the next step.

Lastly, the **Deliver** phases were highly structured when the ideas were clearly documented and easily followed in the translation to Figma. The process relayed on a different kind of structure where components and other elements in Figma need to be developed in a clear manner to ensure global changeability and refinement.

When refining the prototype in the third iteration, a copy of the initial hi-fi prototype was made, which brought issues of elements being connected to the initial one instead of the refined. This, together with Figma not having all functions available and needing unplanned ways of working in certain moments, made the process of prototyping taking more time than initially expected. Thankfully, the planning was made generously from start and the finalized prototypes were completed when needed. The results from the Deliver phases enabled realistic testing to evaluate the concepts.

7.2 Discussion of the Results

In this section the results will be discussed based on the two subordinate research questions *What needs and demands emerge when supporting furniture SMEs in understanding and planning circular business models?* and *What potential effects can a digital tool have on furniture SMEs, and on their understanding of developing more circular business models?*. Together this will lead to answering the main research question *What value can a digital tool provide in supporting furniture SMEs to develop more circular business models?* in the following section.

Before addressing the research questions individually, it is worth noting that the study's two contributions, the empirical findings and the design artifact, are not separable. The prototype is not merely an outcome of the needs analysis, it is also a vehicle through which needs became visible, as the act of designing and evaluating the tool revealed demands that interviews alone could not fully surface [33]. The process of designing for many different competencies and roles, under conditions of low digital maturity and constrained resources, is therefore itself a result - one that demonstrates what interaction design methodology can contribute to circular business model support.

It should also be noted that the tool's value is most pronounced for SMEs at an earlier stage of circular maturity. Companies already operating advanced circular strategies may find less immediate need, which is consistent with the tool's intended purpose of initiating and structuring circular business model development rather than managing already established ones.

7.2.1 Needs and Demands of Furniture SMEs

From the user studies, a large amount of requirements and guidelines emerged, informing the needs and demands of the users. They are all presented in Appendix K, and the most prominent will be presented in this section. The interviews revealed that furniture SMEs rarely lack circular ambition, but rather the structure and systematization needed to act on it. Circular activities such as refurbishment, modular design, and spare part management were already present in many of the participating companies, but had evolved organically rather than through deliberate business model planning. This aligns with Nikolic and Dahlberg [48] presented in Chapter 3, who identify that SMEs face distinct challenges in circular transitions not primarily

due to lack of awareness, but due to scarce internal expertise and a need for immediately actionable support. The core need emerging here is therefore not education about circularity in abstract terms, but support in formalizing and structuring what companies are already doing into a coherent circular business model.

Alongside this, SMEs expressed a clear need for decision support when navigating circular strategies. Understanding what different strategies demand in practice, how they relate to the company's current capabilities, and how others have made similar transitions were recurring themes. Inspiration from concrete examples and the ability to compare alternatives were described as valuable inputs to decision-making that companies currently lack access to in a structured form. As Szopinski et al. [30] notes in Chapter 3, no existing digital tool fully addresses this range of functions, suggesting that the needs identified here reflect a broader gap in available support rather than being specific to this sample.

A further need concerned time and resource constraints. This regards several aspects, where one is to take into account their financial constraints and commonly lack of staff. Given that sustainability and circularity responsibilities in SMEs often fall on already full existing roles, any supporting tool must be adaptable to an already demanding workday. Fritscher and Pigneur [29] emphasize that this context demands simplicity, clarity, and strong visual communication in digital tools, and Rizos et al. [3] similarly highlight limited staff capacity and financial resources as key barriers to circular implementation among SMEs. The ability to work asynchronously, gradually, and without disrupting daily operations was therefore identified as a demand rather than a preference.

7.2.2 Potential Effects of a Digital Tool

The usability tests and expert evaluations suggest that the tool has the potential to address several of the needs identified above, though with important nuances. **Structure and automation** is one of the most prominent effects. The step-by-step process and summary functions were consistently appreciated across participants. This points to a potential effect beyond the tool's primary output: the process of working through the tool itself encourages systematic reflection on the business model. The automation of inputs carrying forward into subsequent steps further reduces friction and reinforces the coherence of the overall process, which aligns directly with the need for systematization identified in the interviews. This is consistent with Fritscher and Pigneur [29] in Chapter 3, who argue that software-based tools address key limitations of static formats by formalizing changes as discrete operations and allowing users to visualize transformation between model states, supporting both reflection and progression.

Another identified effect was **making the abstract concrete through visualization**. The value chain visualization and the CBMC were the elements participants remembered and appreciated most. This suggests that a significant part of the tool's value lies in translating something inherently abstract, a circular business model, into something visible and tangible. For SMEs that described the process of business model change as difficult to imagine in practical terms, this effect may

be particularly relevant. As Goldman et al. [37] describes, interaction design in organizational contexts mediates how practitioners understand and enact change a function that the visualization elements appear to fulfill in practice here.

Furthermore, an effect emerging in relation to the needs was for the digital tool to work as decision support as a potential but communication-dependent. The strategy comparison function and the percentage-based match indicator were appreciated when understood, but were consistently misinterpreted by participants. The potential value of automated decision support is therefore present, but is contingent on how clearly its logic is communicated. This reflects a broader principle in interaction design where, as Rogers et al. [35] note, usability and learnability are prerequisites for a tool's functional value to be realized a finding here demonstrated empirically rather than assumed. This does not diminish the value of the function, but highlights that interface clarity is a prerequisite for the effect to be realized.

Lastly, **value across different stages of circular maturity** was a prominent identified effect. Participants who were already working actively with circularity found the tool less immediately necessary for their own use. This is worth contextualizing: the tool is designed to support the development of a new circular business model, not to manage or optimize one already in operation. It is therefore not unexpected that companies at a more advanced stage of circular maturity perceive less immediate need. Nikolic and Dahlberg [48] similarly note that the furniture sector has generally not undergone the same degree of digital transformation as other industries, suggesting that the tool's value is likely most pronounced for the larger share of SMEs that have not yet formalized their circular ambitions. Importantly, the tool is designed to allow companies to build on and add multiple business models over time, meaning its value is not limited to a single use but can grow with the company's circular ambitions.

7.3 Respond to the Research Question

The two subordinate research questions, addressed in the preceding section, together form the basis for answering the main research question. The following addresses each in turn before arriving at a concluding answer. Together, they point toward a coherent answer to what value such a tool can provide.

Regarding the first subordinate research question, *What needs and demands emerge when supporting furniture SMEs in understanding and planning circular business models?*, the study identifies several key needs and demands emerging from this context. SMEs need a structured process that breaks down circular business model development into manageable steps, decision support that connects their existing capabilities to relevant circular strategies, information that explains what strategies mean in practice, including regulatory implications and required activities, and a tool that accommodates asynchronous and collaborative ways of working. These are operationalized in the requirements and guidelines presented in Appendix K.

Regarding the second subordinate research question, *What potential effects can a digital tool have on furniture SMEs, and on their understanding of developing more*

circular business models?, the study indicates that a digital tool can address these needs, e.g. for structure, decision support, and time-efficient engagement, in several ways. The structured process itself encourages systematic reflection that many SMEs struggle to prioritize within constrained everyday workflows. Visualization of the value chain and BMC makes abstract strategic concepts tangible and easier to discuss and act on within the organization. Automated decision support can guide strategic choices, provided it is communicated clearly enough to be understood. In response to this research question, the study shows that a digital tool can affect furniture SMEs' understanding of circular business model development by making the process navigable, by surfacing strategic options in relation to company-specific capabilities, and by building confidence through structured reflection and visual output.

Taken together, these findings suggest an answer to the main research question, *What value can a digital tool provide in supporting furniture SMEs to develop more circular business models?*. The results show that a digital tool can provide value to furniture SMEs primarily by structuring a process that would otherwise be unstructured, by making circular business model development accessible to companies without dedicated resources or expertise, and by translating abstract strategic choices into concrete and comparable options. The value is therefore not limited to the tool's output in the form of a CBMC, but is embedded in the process of using the tool itself. As circular ambitions grow, the tool's design to support multiple business models over time further extends this value beyond a single use.

7.4 Future Work

The future work of this project is linked to the limitations of the study in terms of time and scope, and can be divided into three areas, where initially, broader evaluation are presented, followed by a more detailed description of unaddressed requirements and design refinements. This includes both continued development of the prototype toward a fully implemented tool, and evaluation at a broader scale.

The study was limited to six companies in Sweden, five of which were SMEs and one a larger company, with a small number of usability test participants. A broader evaluation involving more companies of different scales at different stages of circular maturity would strengthen the generalizability of the findings. This should include users with lower access to and ability to use digital tools through e.g. mobility impairment, to ensure inclusion. A survey-based study with a larger sample would give a more complete picture of how the tool addresses the needs of the furniture industry at large, and what design choices are most effective for this purpose. Furthermore, long-term evaluation, following companies through an actual CBM transition using the tool, would provide insights into long-term effects that the current study could not capture. Future studies could also extend beyond the Swedish furniture industry to include companies across different sectors and regions.

7.4.1 Design and Interface Refinements

Several design improvements were identified through the usability tests and expert evaluations but could not be implemented within the project's time frame. These are available as requirements and guidelines in Appendix H from the usability tests and through a documented list in Appendix S from the expert tests, and the following represent the most prominent changes emerging from the expert evaluations prioritized for future implementation:

- Reduce layering of overlapping interface elements while maintaining visual distinction between components and functions
- Clarify the color coding of the progress bar to more clearly communicate step status and editability
- Clarify the meaning of the percentage indicator more prominently, for example through labeling or a highlighted tooltip, as it was consistently misinterpreted across both usability and expert sessions
- Reposition previous/next navigation buttons closer to the progress bar for stronger logical connection
- Enable editing of previous steps without restarting the entire process, for example by navigating back from a summary to change an entry
- Automate updates to related steps when changes are made for dropdown-based inputs, while keeping free-text entries editable only by the user
- Reconsider the use of red color in the confirmation dialog, as participants associated it with errors rather than a deliberate and significant action
- Introduce clearer visual indicators showing connections between steps in the process, such as directional arrows or highlighted pathways
- Color-code information types within guidance texts, such as descriptions, examples, and instructions, to help users identify and prioritize what to read

From the requirements and guidelines emerged from the study, the ones prioritized as 'Could have's' and 'Won't have's' were not addressed nor fulfilled in the prototype. These are all available in Appendix K and also lay as a base of future work, where some of the design refinements identified across iterations are:

- Enable working with several strategies simultaneously in one process (Requirement 49, declared out of scope after discussion with CirkuTrä and RE:Furn)
- Enable prioritization and visual deprioritization among strategies, including SWOT-style and KPI-based mapping (Requirements 50, 46.21, 46.22)
- Enable more complex, layered visualization of the business model (Requirements 9.22, 48.16)
- Enable role-specific UX/UI for different internal stakeholders (Requirement 1.5)

7.4.2 Unaddressed Functional Requirements

Several requirements were identified as valuable but classified as 'Won't Have' or 'Could Have' due to time and scope limitations, the full list can be seen in Appendix K. This extract represents natural next steps for continued development:

System integration and adaptability:

- Integration with existing digital systems such as Office365, ERP systems, and Excel (Requirements 40-40.23)
- Adaptability to Digital Product Passport systems as they become mandatory (Requirement 10)
- Industry 4.0 infrastructure integration (Requirement 1.1)

Collaboration and community:

- Enable collaborative modeling between internal stakeholders simultaneously (Requirements 13-13.2)
- Support for workshop-based execution of tasks, as suggested by participants (Requirement 16.21)
- Enable external collaboration and knowledge-sharing between companies (Requirements 16-16.2)

Market and lifecycle tracking:

- Enable tracking of sold products and retrieval at end of life (Requirements 32.1, 32.2)
- Enable following of the product's full life cycle (Requirement 8)
- Include market demand analysis and benchmarking against industry practices (Requirements 31.2, 31.3)

Extended tool functionality:

- Enable use of the tool after business model development, including progression tracking post-transition (Requirements 17, 17.1)
- Include an AI or human consultant within the guidance of the process (Requirements 6.11, 6.12)
- Enable evaluation of the new CBM for continued improvement (Requirement 22)
- Include sustainability metrics dashboard during development (Requirement 11.3)

7.5 Ethical and Social Considerations

This thesis focused on supporting SMEs within the Swedish furniture sector in their transition from linear to CBMs. The primary focus of the work were therefore on furniture SMEs, as both the empirical material and the design exploration are developed around their specific organizational structures, resource constraints, and operational conditions. While the study was empirically situated within the furniture sector in Sweden, the insights and outcomes may also be relevant for SMEs in other sectors that face similar challenges in adopting CBMs, even if these are not directly included in the research process. The findings may further be of interest to furniture clusters, sustainability researchers, and policy-oriented stakeholders working with CE transitions. Indirectly, the work may also benefit furniture customers and society at large through its potential contribution to more sustainable production and consumption systems, resource efficiency, and waste reduction.

As the study included SMEs in Sweden as its main target group, with a particular focus on the furniture businesses, larger companies, organizations outside of Sweden, and companies outside the furniture sector were excluded from the empirical scope. This limitation were necessary to maintain a manageable research scope, but it also means that the results may not be directly transferable to larger organizations or to contexts with different regulatory, economic, or infrastructural conditions. Additionally, the project assumes access to and basic ability to use digital tools, which may indirectly exclude actors with limited digital literacy or accessibility challenges, such as individuals with visual, cognitive, or mobility impairments.

If the outcomes of this work were to be broadly adopted, several groups could be advantaged. These include furniture SMEs seeking to transition towards CBMs, SMEs more generally, and professional groups involved in circular practices such as restoration, repair, refurbishment, and re-upholstery, where demand for labor and expertise could increase. At a societal level, such transitions may contribute to environmental sustainability goals in Sweden and the EU through reduced resource extraction, lower waste generation, and more sustainable production and consumption patterns. In contrast, potential disadvantages may arise for actors whose business models depend on linear resource extraction and raw material production, as well as for companies that are unwilling or unable to engage in circular transitions due to economic, structural, or organizational constraints.

Another potential implication of the project is that digital support tools for CBM development may partially replace certain forms of consultancy work, particularly consultants involved in helping companies identify, develop, and implement circular business models. This could reduce demand for some types of sustainability and business model consulting services, especially in early-stage exploration and ideation processes. At the same time, the tool is primarily intended to support SMEs that may lack the financial resources to hire specialized consultants, making guidance for circular transitions more accessible to smaller organizations. The project therefore positions the tool as a complement to, rather than a full replacement for, expert consultants, whose broader strategic, organizational, and context-specific expertise remains important in more complex transition processes.

From an ethical and methodological perspective, the project was conducted in accordance with principles of informed consent, data minimization, and participant anonymity. All participants in user studies and interviews provide informed consent, and collected data was limited to audio and screen recordings, avoiding video material including the participant in order to reduce the risk of personal identification. Data was stored securely and kept only for the duration of the project, or until participants request its removal, in line with GDPR principles. In all published and presented material, participants and organizations are anonymized.

The project also involved limited use of AI-based tools, primarily as language refinement, as support in ideation processes, and as a supplementary aid in analysis to check for potential blind spots. AI was not used for generating empirical data, making analytical decisions, or replacing human interpretation, and its outputs were treated as supportive rather than authoritative. This approach was intended to maintain academic integrity, methodological transparency, and accountability in the research process.

Overall, the project positioned itself as a design- and research-based contribution aimed at supporting sustainable transitions within a clearly defined context. Its ethical stance was grounded in responsibility towards participants, awareness of structural exclusions, transparency in methodological choices, and a recognition of the broader social and environmental implications of circular economy transformations.

8

Conclusion

This project set out to support the transition of furniture SMEs towards a circular economy (CE) by developing and evaluating a prototype of a practical, action-oriented digital tool. While circular business model frameworks exist, a gap remained in how these can be translated into accessible, user-centered tools that fit the operational realities of SMEs. Through an iterative design process involving SME practitioners, the study investigated both what these companies need and how a digital artifact can respond to those needs. To keep in mind with the restricted demographic, the generalization of the results are limited.

The results show that furniture SMEs rarely lack circular ambition, but rather the structure, decision support, and resources needed to act on it. A digital tool can provide value by formalizing what companies are already doing into a coherent circular business model, by making abstract strategic choices concrete and comparable, and by embedding this process in a guided, step-by-step structure that fits within an already constrained workday. The value is not limited to the tool's output in the form of a CBMC, but is embedded in the process of using the tool itself. That said, the devil is in the details: decision support functions, such as the strategy-matching indicator, hold clear potential, but their value is dependent on interface clarity. The tool's effects depend heavily on how well its logic is communicated to the user.

In answer to the main research question, the study concludes that a digital tool can provide value to furniture SMEs primarily through three mechanisms: by structuring a process that would otherwise be unstructured, by making circular business model development accessible without dedicated expertise, and by translating strategic choices into concrete and comparable options.

To realize this potential more fully, future work should address the design refinements identified through usability and expert testing, particularly around navigation clarity, information hierarchy, and the communication of automated decision support. Beyond design, broader evaluation involving more companies at different stages of circular maturity, and eventually long-term studies following companies through an actual transition, would strengthen the evidence base for the tool's value.

More broadly, this project demonstrates what interaction design and Research through Design can contribute to the field of circular business model development. By grounding the design process in user needs and iterative evaluation, the study produced not only a prototype but a structured understanding of what furniture

8. Conclusion

SMEs require to engage meaningfully with circular strategies. The approach shows that interaction design is a productive lens for investigating how digital artifacts can support organizational change, and that translating an existing framework into a user-centered tool is itself a form of knowledge generation about both the framework and its intended users.

Bibliography

- [1] European Commission. “First circular economy action plan,” Accessed: Jan. 21, 2026. [Online]. Available: https://environment.ec.europa.eu/topics/circular-economy-topics/first-circular-economy-action-plan_en.
- [2] J. L. K. NuSSholz, “Circular business models: Defining a concept and framing an emerging research field,” *Sustainability*, vol. 9, no. 10, p. 1810, 2017. DOI: 10.3390/su9101810.
- [3] V. Rizos et al., “Implementation of circular economy business models by small and medium-sized enterprises (smes): Barriers and enablers,” *Sustainability*, vol. 8, no. 11, 2016, ISSN: 2071-1050. DOI: 10.3390/su8121212. [Online]. Available: <https://www.mdpi.com/2071-1050/8/11/1212>.
- [4] M. Kans, C. M. Hettiarachchige, and D. Paulin, “Circular strategies in the swedish furniture industry - a business modelling approach,” Chalmers University of Technology, Tech. Rep., 2023.
- [5] D. Lutyens. “Swedes like generous, personal, lived-in spaces: The Scandi home-ware style that Swedish people love,” Accessed: Jan. 20, 2026. [Online]. Available: <https://www.bbc.co.uk/culture/article/20250620-the-true-scandi-style-that-swedes-love>.
- [6] Swedish Forest Industries. “Insights about swedish forests and forestry,” Accessed: Jan. 20, 2026. [Online]. Available: <https://www.forestindustries.se/forest-industry/forest-management/insights-swedish-forests-and-forestry/>.
- [7] Trä- och Möbelföretagen, “Furniture facts sweden – 2023,” SCB / Svandata, Tech. Rep., 2023. Accessed: Jan. 20, 2026. [Online]. Available: https://www.tmf.se/imagevault/publishedmedia/2dspwoo04d2aadsrlv0u/Annual_statistics_furniture_-_2023-preliminary-.pdf.
- [8] A. Basu. “Environmental impact of furniture manufacturing,” Accessed: Jan. 20, 2026. [Online]. Available: <https://www.artisanfurniture.net/news/environmental-impact-of-furniture-manufacturing/>.
- [9] M. Lewandowski, “Designing the business models for circular economytowards the conceptual framework,” *Sustainability*, vol. 8, 2015. DOI: doi.org/10.3390/su8010043.
- [10] N. M. P. Bocken, S. W. Short, P. Rana, and S. Evans, “Towards a typology of sustainable business model archetypes,” *Journal of Cleaner Production*, vol. 65, pp. 42–56, 2014.

- [11] L. Bolin, E. Rex, F. Røyne, and H.-L. Norrblom, “Hållbarhetsanalys av cirkulära möbelflöden,” RISE Research Institutes of Sweden, Tech. Rep. SP-rapport 2017:32, 2017. [Online]. Available: <https://www.diva-portal.org/smash/get/diva2:1171159/FULLTEXT01.pdf>.
- [12] U. Avedal Åberg. “Forskning, dialog och samarbete ska stödja skiftet till effektiv återtillverkning inom möbelindustrin,” Accessed: Jan. 20, 2026. [Online]. Available: <https://www.chalmers.se/aktuellt/nyheter/prod-effektiv-atertillverkning-inom-mobelindustrin/>.
- [13] European Parliament. “Circular economy: Definition, importance and benefits.” Published: 24-05-2023; Last updated: 24-05-2023 - 11:49, Accessed: Jan. 21, 2026. [Online]. Available: <https://www.europarl.europa.eu/topics/en/article/20151201ST005603/circular-economy-definition-importance-and-benefits>.
- [14] Circular Sweden. “Cirkularitet.” Cirkulär rapport 2025, Accessed: Jan. 30, 2025. [Online]. Available: <https://www.circularsweden.se/cirkularitet>.
- [15] P. B. Seddon, G. P. Lewis, P. Freeman, and G. Shanks, “The case for viewing business models as abstractions of strategy,” *Communications of the Association for Information Systems*, vol. 13, no. 1, pp. 427–442, 2004. DOI: 10.17705/1CAIS.01325. [Online]. Available: <https://aisel.aisnet.org/cais/vol13/iss1/25>.
- [16] A. Osterwalder and Y. Pigneur, *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers* (The Strategyzer Series). Wiley, 2010, ISBN: 9780470876411. [Online]. Available: <https://books.google.se/books?id=UzuTAAQBAJ>.
- [17] European Commission. “Sme definition,” Accessed: Jan. 21, 2026. [Online]. Available: https://single-market-economy.ec.europa.eu/smes/sme-fundamentals/sme-definition_en.
- [18] Chalmers University of Technology. “Cirkuträ - circular business models for the wood furniture industry.” No date available, Accessed: Feb. 12, 2026. [Online]. Available: <https://research.chalmers.se/project/11159>.
- [19] Chalmers University of Technology. “Re:furn - resource-efficient and circular furniture flows.” No date available, Accessed: Feb. 12, 2026. [Online]. Available: <https://research.chalmers.se/project/11273>.
- [20] C. M. Hetti-Arachchige, M. Kans, and P. Almström, “Exploring barriers and opportunities of remanufacturing in the swedish furniture industry,” in *Proceedings of the 4th Product Lifetimes and the Environment Conference (PLATE)*, Berlin, Germany: Technische Universität Berlin, 2019.
- [21] T. Flintberg, “Cirkulär ekonomi - möjligheter och utmaningar: En kvantitativ studie över potentialen för en cirkulär affärsmodell inom möbelindustrin,” C-uppsats, Linköpings universitet, 2015. [Online]. Available: <https://www.diva-portal.org/smash/get/diva2:813566/FULLTEXT01.pdf>.
- [22] L. Hobro, “Circular furniture management in swedish regional counties: Challenges, opportunities, and the potential of wooden furniture,” Masters thesis, M.S. thesis, Linnéuniversitet, 2024. [Online]. Available: <https://www.diva-portal.org/smash/get/diva2:1880925/FULLTEXT01.pdf>.

-
- [23] M. Kans and C. M. Hetti Arachchige, “Adapting to circularity: Value chain evaluation in the swedish furniture industry,” Unpublished manuscript, Chalmers University of Technology, 2025.
 - [24] E. Pettersson Borg and L. Johansson, “En cirkulär möbelindustri: Affärsmodellens betydelse i materias hållbara utveckling,” ReFurn/CirkuTrä project material, Bachelor’s thesis, Chalmers tekniska högskola, 2025. [Online]. Available: <http://hdl.handle.net/20.500.12380/309618>.
 - [25] M. Kans and M. Löfving, “Kartläggning av förutsättningar för effektiv återtillverkning av möbler i offentlig miljö,” Chalmers tekniska högskola / Träcentrum Kompetensutveckling AB, Vera Sandbergs Allé 8, 412 96 Göteborg, Sweden, Slutrapport P2022-00321, Apr. 2023.
 - [26] M. Kans and M. Löfving, “Unlocking the circular potential: A review and research agenda for remanufacturing in the european wood products industry,” *Journal of Cleaner Production*, vol. 397, p. 136 560, 2023. DOI: 10.1016/j.jclepro.2023.136560.
 - [27] I. Uvarova, D. Atstaja, and V. Korpa, “Challenges of the introduction of circular business models within rural smes of eu,” *International Journal of Economic Sciences*, vol. 9, no. 2, 2020. DOI: 10.20472/ES.2020.9.2.008.
 - [28] L. Malooly and T. Daphne. “R-strategies for a circular economy,” Circularise, Accessed: Feb. 11, 2026. [Online]. Available: <https://www.circularise.com/blogs/r-strategies-for-a-circular-economy>.
 - [29] B. Fritscher and Y. Pigneur, “Visualizing business model evolution with the business model canvas: Concept and tool,” in *2014 IEEE 16th Conference on Business Informatics*, vol. 1, 2014, pp. 151–158. DOI: 10.1109/CBI.2014.9.
 - [30] D. Szopinski, T. Schoormann, T. John, R. Knackstedt, and D. Kundisch, “Software tools for business model innovation: Current state and future challenges,” *Electron Markets* 30, pp. 469–494, 2020. DOI: 10.1007/s12525-018-0326-1.
 - [31] RISE. “Verktyg för cirkulär omställning,” Accessed: Apr. 24, 2026. [Online]. Available: <https://www.ri.se/sv/systeminnovation/cirkular-omstallning/expertis/verktyg-for-cirkular-omstallning>.
 - [32] Science Park Borås and Interior Cluster Sweden, *Progression model: Tool for self assessment*, Accessed: 2025-02-16, Data to Business, Interreg Öresund-Kattegat-Skagerrak, n.d.
 - [33] J. Zimmerman, J. Forlizzi, and S. Evenson, “Research through design as a method for interaction design research in hci,” in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, ser. CHI ’07, San Jose, California, USA: Association for Computing Machinery, 2007, pp. 493–502, ISBN: 9781595935939. DOI: 10.1145/1240624.1240704.
 - [34] Å. Wikberg-Nilsson, Å. Ericson, and P. Törlind, *Design: Process och metod*, Swedish, 2nd ed. Lund, Sweden: Studentlitteratur AB, 2021, p. 257, ISBN: 978-91-44-14339-2. [Online]. Available: <https://urn.kb.se/resolve?urn=urn:nbn:se:ltu:diva-87179>.
 - [35] Y. Rogers, H. Sharp, and J. Preece, *Interaction Design: Beyond Human - Computer Interaction* (Interaction Design: Beyond Human-computer Interaction). Wiley, 2011, ISBN: 9780470665763. [Online]. Available: https://books.google.se/books?id=b-v_6BeCwwQC.

- [36] Interaction Design Foundation. “What is interaction design (ixd)?” Interaction Design Foundation, Accessed: Apr. 30, 2026. [Online]. Available: <https://ixdf.org/literature/topics/interaction-design>.
- [37] E. Goldman, E. Stolterman, and R. Wakkary, “Understanding interaction design practices,” *interactions*, vol. 18, no. 5, pp. 36–41, 2011. DOI: 10.1145/2008176.2008186.
- [38] M. Walker, L. Takayama, and J. A. Landay, “High-fidelity or low-fidelity, paper or computer? choosing attributes when testing web prototypes,” in *Proceedings of the Human Factors and Ergonomics Society 46th Annual Meeting*, Human Factors and Ergonomics Society, Santa Monica, CA, USA, 2002.
- [39] K. Pernice. “UX prototypes: Low fidelity vs. high fidelity,” Nielsen Norman Group, Accessed: Apr. 27, 2025. [Online]. Available: <https://www.nngroup.com/articles/ux-prototype-hi-lo-fidelity/>.
- [40] N. Bevan, J. Carter, and S. Harker, “Iso 9241-11 revised: What have we learnt about usability since 1998?” In *Human-Computer Interaction: Design and Evaluation*, M. Kurosu, Ed., Cham: Springer International Publishing, 2015, pp. 143–151.
- [41] Interaction Design Foundation. “What is usability?” IxDF – Interaction Design Foundation, Accessed: Apr. 29, 2026. [Online]. Available: <https://ixdf.org/literature/topics/usability>.
- [42] J. Nielsen. “Usability 101: Introduction to usability,” Nielsen Norman Group, Accessed: Apr. 29, 2026. [Online]. Available: <https://www.nngroup.com/articles/usability-101-introduction-to-usability/>.
- [43] E. D. Kennedy. “The responsive website font size guidelines,” Accessed: Mar. 13, 2026. [Online]. Available: <https://www.learnui.design/blog/mobile-desktop-website-font-size-guidelines.html>.
- [44] Material Design. “Color roles,” Accessed: Mar. 31, 2026. [Online]. Available: <https://m3.material.io/styles/color/roles>.
- [45] A. Cooper, R. Reimann, D. Cronin, and C. Noessel, *About Face: The Essentials of Interaction Design*, 4th. Wiley Publishing, 2014, ISBN: 1118766571.
- [46] Material Design. “Checkboxes,” Accessed: May 5, 2026. [Online]. Available: <https://m2.material.io/components/checkboxes>.
- [47] S. L. Henry. “Wcag 2 overview.” First published July 2005, World Wide Web Consortium (W3C), Accessed: Apr. 29, 2026. [Online]. Available: <https://www.w3.org/WAI/standards-guidelines/wcag/>.
- [48] A. Nikolic and J. Dahlberg, *Digital transformation och företagsöverlevnad i möbelindustrin*, Bachelor’s thesis, Ämne: Informatik. Handledare: Sadaf Salavati, 2025. Accessed: Apr. 24, 2025. [Online]. Available: <https://www.diva-portal.org/smash/get/diva2:1981699/FULLTEXT01.pdf>.
- [49] Y. Lu, “Impact of digital technologies on organizational change strategies: A review,” *Research Journal in Business and Economics*, vol. 2, pp. 01–11, Oct. 2024. DOI: 10.61424/rjbe.v2i1.128.
- [50] European Circular Economy Stakeholder Platform, “Repair sector,” European Circular Economy Stakeholder Platform, Tech. Rep., 2022. Accessed: Apr. 24, 2026. [Online]. Available: <https://circulareconomy.europa.eu/platform/sites/default/files/2022-12/Repair%20sector.pdf>.

-
- [51] F. Eggert, I. Rahm, and C. Fuentes, “Digital platforms for circular shopping: Slowing down and speeding up second-hand clothing consumption,” *The International Review of Retail, Distribution and Consumer Research*, vol. 0, no. 0, pp. 1–20, 2025. DOI: 10.1080/09593969.2025.2516682.
 - [52] K. Jespersen and K. J. Ting. “Rethinking the future: Digital technologies powering the circular economy,” Nordic ESG Lab, Copenhagen Business School, Accessed: Apr. 24, 2025. [Online]. Available: <https://nordicesglab.cbs.dk/rethinking-the-future-digital-technologies-powering-the-circular-economy/>.
 - [53] European Data Portal. “EU’s digital product passport: Advancing transparency and sustainability,” European Data Portal, Accessed: Apr. 24, 2025. [Online]. Available: <https://data.europa.eu/en/news-events/news/eus-digital-product-passport-advancing-transparency-and-sustainability>.
 - [54] B. Fogg, “Persuasive technology: Using computers to change what we think and do,” *Ubiquity*, vol. 3, Jan. 2002. DOI: 10.1145/763955.763957.
 - [55] C. Nguyen. “5 ux design frameworks every designer should master in 2026,” Accessed: Mar. 31, 2026. [Online]. Available: <https://uxplaybook.org/articles/5-fundamental-ux-design-frameworks-2026>.
 - [56] S. Gibbons. “Design thinking 101,” Nielsen Norman Group. [Online]. Available: <https://www.nngroup.com/articles/design-thinking/>.
 - [57] IDEO U. “What is human-centered design? a complete guide for innovators.” Updated July 21, 2025. Accessed: 2026-05-13. [Online]. Available: <https://www.ideo.com/blogs/inspiration/what-is-human-centered-design>.
 - [58] Google Ventures. “The design sprint,” Accessed: May 13, 2026. [Online]. Available: <https://www.gv.com/sprint/>.
 - [59] J. Gothelf and J. Seiden, *Lean UX: Applying Lean Principles to Improve User Experience*, 1st ed. O’Reilly Media, 2013, ISBN: 9781449311650.
 - [60] Design Council. “The double diamond,” Accessed: Jan. 21, 2026. [Online]. Available: <https://www.designcouncil.org.uk/our-resources/the-double-diamond/>.
 - [61] Y. Wadsworth, *Do It Yourself Social Research, The Bestselling Practical Guide to Doing Social Research Projects*, English, 3rd ed. Routledge, 2011, ISBN: 9781003115373. DOI: 10.4324/9781003115373.
 - [62] H. Snyder, “Literature review as a research methodology: An overview and guidelines,” *Journal of Business Research*, vol. 104, pp. 333–339, 2019, ISSN: 0148-2963. DOI: 10.1016/j.jbusres.2019.07.039. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0148296319304564>.
 - [63] Coursera Staff. “Market analysis: What it is and how to conduct one,” Coursera, Accessed: Apr. 27, 2025. [Online]. Available: <https://www.coursera.org/articles/market-analysis>.
 - [64] H. Alshenqeeti, “Interviewing as a data collection method: A critical review,” *English Linguistics Research*, vol. 3, Jan. 2014. DOI: 10.5430/elr.v3n1p39.

- [65] F. Ryan, M. Coughlan, and P. Cronin, "Interviewing in qualitative research: The one-to-one interview," *International Journal of Therapy And Rehabilitation*, vol. 16, pp. 309–314, Jun. 2009. DOI: 10.12968/ijtr.2009.16.6.42433.
- [66] Interaction Design Foundation. "Usability testing," Accessed: Jan. 21, 2026. [Online]. Available: <https://www.interaction-design.org/literature/topics/usability-testing>.
- [67] K. Moran. "Usability (user) testing 101," Nielsen Norman Group, Accessed: Mar. 4, 2026. [Online]. Available: <https://www.nngroup.com/articles/usability-testing-101/>.
- [68] A. Harley. "Ux expert reviews," Nielsen Norman Group, Accessed: Apr. 28, 2026. [Online]. Available: <https://www.nngroup.com/articles/ux-expert-reviews/>.
- [69] V. Braun and V. Clarke, "Using thematic analysis in psychology," *Qualitative Research in Psychology*, vol. 3, no. 2, pp. 77–101, 2006. DOI: 10.1191/1478088706qp063oa. [Online]. Available: <https://doi.org/10.1191/1478088706qp063oa>.
- [70] R. F. Dam and Y. S. Teo. "Affinity diagrams: How to cluster your ideas and reveal insights," Interaction Design Foundation, Accessed: Mar. 6, 2026. [Online]. Available: <https://ixdf.org/literature/article/affinity-diagrams-learn-how-to-cluster-and-bundle-ideas-and-facts>.
- [71] Figma. "Figjam: The online collaborative whiteboard for teams," Accessed: Apr. 28, 2026. [Online]. Available: <https://www.figma.com/figjam/>.
- [72] P. Samuels, *A really simple guide to quantitative data analysis*, Apr. 2020. DOI: 10.13140/RG.2.2.25915.36645.
- [73] L.-O. Bligård, *ACD3: Utvecklingsprocessen ur ett människamaskinperspektiv*, 2nd ed. Göteborg: Chalmers tekniska högskola, Institutionen för produkt- och produktionsutveckling, Avdelning Design & Human Factors, 2015, Med stöd av Eva Simonsen.
- [74] S. Gibbons. "5 prioritization methods in UX roadmapping," Nielsen Norman Group, Accessed: Apr. 27, 2025. [Online]. Available: <https://www.nngroup.com/articles/prioritization-methods/>.
- [75] A. F. Osborn, *Applied Imagination: Principles and Procedures of Creative Thinking*. Charles Scribner's Sons, 1953.
- [76] A. van Boeijen and J. Daalhuizen, Eds., *Delft Design Guide*. Delft, Netherlands: TU Delft, 2010, First compilation by Wouter van der Hoog; Available via TU Delft OpenCourseWare: <https://ocw.tudelft.nl>.
- [77] Y. Wijnia, D. Clausen, P. Herder, K. Katsikopoulos, E. Subrahmanian, and D. Frey, "The pugh controlled convergence method: Model-based evaluation and implications for design theory," *Daniel Frey*, vol. 20, Oct. 2009. DOI: 10.1007/s00163-008-0056-z.
- [78] Figma. "Wireframe vs. mockup—what's the difference?" Accessed: Apr. 27, 2026. [Online]. Available: <https://www.figma.com/resource-library/wireframe-vs-mockup/>.
- [79] N. Carter, D. Bryant-Lukosius, A. DiCenso, J. Blythe, and A. J. Neville, "The use of triangulation in qualitative research," *Oncology Nursing Forum*, vol. 41, no. 5, pp. 545–547, Sep. 2014. DOI: 10.1188/14.ONF.545-547.

- [80] Klang.ai. “What is klang?” Accessed: May 12, 2026. [Online]. Available: <https://help.klang.ai/getting-started/what-is-klang/>.
- [81] WebAIM, *Contrast checker*, n.d. Accessed: Apr. 21, 2026. [Online]. Available: <https://webaim.org/resources/contrastchecker/>.

A

Categories Emerged from KJ Analysis after Interviews

This appendix includes the categories emerged from the initial KJ analysis following the interviews. They are divided into main categories, subcategories and subsubcategories. Each category has numbers in brackets indicate the number of expressions/post-its followed by the number of participants contributing to that category. Counts for main categories include all expressions within their underlying subcategories and sub-subcategories. They are sorted from most to least amount of expressions/post-its included in the category.

Main category	Subcategory	Sub-subcategory
To change business model is a complex process [166/6]	Guidance helps work of change [37/5]	Human factor strengthens trust [7/3]
	Understanding how it will work practically can increase engagement [27/5]	
	Regulations and certificates help towards circularity [23/2]	Regulations demand a lot of work [8/2]
	Follows the development of circularity [16/6]	
	Knowing the consequences strengthens trust in the business model [15/4]	
	There is always improvement and development potential [9/5]	
	It should feel simple [9/3]	
	They want to be included in the entire life cycle [6/2]	
	It takes time to switch ways of working [4/3]	

Main category	Subcategory	Sub-subcategory
They have difficulties handling the practical parts after transitioning [56/5]	They need systematics [33/5]	
	They have difficulties handling the logistics [11/3]	
	They have difficulties understanding the manpower needed [7/3]	
	They rarely have meetings regarding circularity [3/1]	
	Higher demand means adjustment on larger scale [2/2]	
They want a digital tool [51/5]	Wants continued use of the tool [7/2]	
	Needs to feel trust in the tool [6/2]	
	Needs to be adaptable for different companies [5/4]	
	The tool should contribute something new [5/1]	
	They want it to be connected to DPP [4/2]	
Businesses use different systems [39/6]	They document using Excel, different business systems or manually [18/5]	
	They use external working methods for development [5/1]	
	Businesses discuss analogue and digital [2/2]	
	They retrieve regulations through respective regulator systems [2/1]	
Customer needs control the market [27/3]	They have difficulties understanding the customers [6/1]	
Appreciates new perspectives [25/5]	They get inspired from others CBMs [10/4]	
Product quality is important [25/4]	Long lifespan is a major focus [11/4]	
	Learning about wear helps steps in the early stages of product development [6/3]	

Main category	Subcategory	Sub-subcategory
The business focuses on making profit [24/6]		
Competence is a limited factor [24/6]	Missing working competencies [13/4]	
	Missing knowledge of circularity [11/4]	
Companies want more contact with customers [24/5]	Want to be able to provide information to customers [8/3]	
	SMEs rarely reach the customers directly [7/3]	
	Want to be able to track forwards [5/2]	
Several stakeholders are involved in transition [23/5]	Several levels of actors are internally involved [11/4]	
	External actors are involved in the transition [11/3]	
Limited to the business possibilities [22/6]		
Marketing is important [21/5]	Customers do not always know that the circular service is offered [14/4]	
	Customers do not always know that it is the company behind it [5/3]	
Customer value is important to the companies [19/5]		
They see CBM as a side track [19/6]		
SMEs have more difficulty with money [17/4]		
Internal drive within the business is needed for change [12/5]		

Bibliography

Main category	Subcategory	Sub-subcategory
The business feels a worry for new business models [12/4]		
Previous condition assessment helps logistics [12/3]		
Time is a limited factor [11/6]		
Positive attitude to circularity [5/2]		
It is an advantage to be small [3/2]		

B

Requirements and Guidelines after Interviews and Literature study

This appendix includes the list of requirements and guidelines formed in the Contextual phase. They emerged following the literature study and interviews, from the KJ categories available in Appendix A. They were prioritized using MoSCoW, with 'Must haves', 'Should haves', 'Could haves', and 'Won't haves'. They were also divided into the categories: information, design, functions, and smaller functions. They are presented in numerical order where the sources are fully visible for traceability.

ID	R / G	Description	Cause/effect	Category	Source	Prioritization
1	R	Be a digital tool	Enable digital use	Design	<i>CirkuTrä/ReFurn Scope & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Must have
1	R	Be a digital tool	Enable digital use	Design	<i>CirkuTrä/ReFurn Scope & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Must have
1,1	R	Include industry 4.0 infrastructure	Enable practical use	Design	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin</i>	Won't have
1,1	R	Include industry 4.0 infrastructure	Enable practical use	Design	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin</i>	Won't have
1,2	G	High usability	Ease use for real-world application	Design	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Must have
1,2	G	High usability	Ease use for real-world application	Design	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Must have
1,3	G	Support low digital maturity	Ease use for real-world application	Design	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & "Framgångsrik affärsmodellinnovation"</i>	Should have
1,3	G	Support low digital maturity	Ease use for real-world application	Design	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & "Framgångsrik affärsmodellinnovation"</i>	Should have
1,31	G	Include low digital complexity	Ease use for real-world application	Design	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Must have
1,31	G	Include low digital complexity	Ease use for real-world application	Design	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Must have
1,4	R	Enable asynchronous use	Ease use for real-world application in real-time	Smaller function	<i>Lit. study/Software tools for business model innovation: current state and future challenges</i>	Could have
1,4	R	Enable asynchronous use	Ease use for real-world application in real-time	Smaller function	<i>Lit. study/Software tools for business model innovation: current state and future challenges</i>	Could have
1,6	R	Enable role-specific UX/UI for internal stakeholders	Tailor experience for designers, manufacturers, suppliers	Smaller function	<i>Lit. study/TMF, 2020</i>	Won't have
1,6	R	Enable role-specific UX/UI for internal stakeholders	Tailor experience for designers, manufacturers, suppliers	Smaller function	<i>Lit. study/TMF, 2020</i>	Won't have
2	R	Base development process on four steps framework from CirkuTrä	Enable applicable results	Function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,1	R	Initiate the development process with analysis of current business modell	Enable understanding of current work	Function	<i>CirkuTrä/ReFurn Scope</i>	Must have

2,11	R	Enable analysis of current business model's actions through focus on the "what"s	Enable concrete understanding of what they are doing	Function	CirkuTrä/ReFurn Scope	Must have
2,111	R	Enable analysis of current business model's actions through what it is that they are doing	Enable concrete understanding of what they are doing	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,112	R	Enable analysis of current business model's actions through what needs they are fulfilling	Enable concrete understanding of what needs their work is fulfilling	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,113	R	Enable analysis of current business model's actions through what problems they are solving	Enable concrete understanding of what problems their work are solving today	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,12	R	Enable analysis of current business model's action through focus on the "how"s	Enable concrete understanding of how they are doing their work	Function	CirkuTrä/ReFurn Scope	Must have
2,121	R	Enable analysis of current business model's action through how they are fulfilling the target groups needs	Enable concrete understanding of how they are doing their work	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,122	R	Enable analysis of current business model's action through howthey are solving the target group's problems	Enable concrete understanding of how they are doing their work	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,123	R	Enable analysis of current business model's action through what the most important activities are	Enable concrete understanding of how they are doing their work	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,124	R	Enable analysis of current business model's action through which competencies and resources are important	Enable concrete understanding of how they are doing their work	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,13	R	Enable analysis of current business model's action through focus on the "who"s	Enable concrete understanding of their current customers and stakeholder	Function	CirkuTrä/ReFurn Scope	Must have
2,131	R	Enable analysis of current business model's action through who their customer or target group is	Enable concrete understanding of their current customers and stakeholder	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,132	R	Enable analysis of current business model's action through what needs and problems does the target group have	Enable concrete understanding of their current customers and stakeholder	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,133	R	Enable analysis of current business model's action through How they reach the target group	Enable concrete understanding of their current customers and stakeholder	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,134	R	Enable analysis of current business model's action through what collaborations they need in there business	Enable concrete understanding of their current customers and stakeholder	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,2	R	Facilitate identifying of future circular strategy as a second step of the development process	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,21	R	Enable identifying of the company's available resources and waste	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,211	R	Enable identifying the company's available resources and scraps through if there are resources possible for better usage	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,212	R	Enable identifying of the company's available resources and scraps through if there are scraps to be used instead of discarded	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have

2,22	R	Enable identifying of the company's customers and partners for the circular business model	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,221	R	Enable identifying of the company's customers through what circular needs and problems their customers have	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,222	R	Enable identifying of the company's partners through which partners/stakeholders have circular needs or problems that the company can solve	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,223	R	Enable identifying of the company's customers and partners through which partners/stakeholders can help the company solve the customers circular needs and problems	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,23	R	Enable identifying the company's circular goals	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,24	R	Present alternatives of circular strategies	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,241	R	Visualise circular strategies (10R/3R framework)	Enable concrete understanding of possible circular strategies	Smaller function	Lit. study/Circularise 10R blog, KansLofving2023, En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling	Must have
2,3	R	Facilitate choice of circular business model as a third step of the development process	Enable concrete understanding of possible circular models	Function	CirkuTrä/ReFurn Scope	Must have
2,31	R	Enable identifying different circular activities based on circular strategies	Enable concrete understanding of possible circular models	Function	CirkuTrä/ReFurn Scope	Must have
2,32	R	Enable decision of circular activities	Enable concrete understanding of possible circular models	Function	CirkuTrä/ReFurn Scope	Must have
2,321	R	Enable decision of distribution of activities to internal or external	Enable concrete understanding of possible circular models	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,322	R	Present alternatives of handling return flows	Enable concrete understanding of possible circular models	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,33	R	Present alternatives of circular business models based on circular strategies	Enable concrete understanding of possible circular models	Function	CirkuTrä/ReFurn Scope	Must have
2,4	R	Enable concretisation of the company's new circular business model	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have
2,41	R	Enable concretisation of the company's customers or target groups	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have
2,411	R	Enable concretisation of the company's customers or target groups through who has similar needs	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,42	R	Enable concretisation of the company's cost and revenues	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have

2,421	R	Enable concretisation of the company's cost through their manpower, material and components, manufacturing, waste management, service, transportation, administration and investments	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,422	R	Enable concretisation of the company's revenues by through their product sales, other product revenue, prive premiums, pay per use, premuneration and leasing	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,423	R	Enable concretisation of the company's revenues through their contracts	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,43	R	Enable concretisation of their new business model through focus on the "what"s	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have
2,431	R	Enable concretisation of their new business model through what it is that they are doing	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,432	R	Enable analysis of their newbusiness model through what needs they are fulfilling	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,433	R	Enable concretisation of their new business model through what problems they are solving	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,44	R	Enable concretisation of their new business model through focus on the "how"s	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have
2,441	R	Enable concretisation of their new business model through how they are fulfilling the target groups needs	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,442	R	Enable concretisation of their new business model through howthey are solving the target group's problems	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,443	R	Enable concretisation of their new business model through what the most important activities are	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,444	R	Enable concretisation of their new business model through which competencies and resources are important	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,45	R	Enable concretisation of their new business model through focus on the "who"s	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have
2,451	R	Enable concretisation of their new business model through who their customer or target group is	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,452	R	Enable concretisation of their new business model through what circular needs and problems does the target group have	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,453	R	Enable concretisation of their new business model through how they reach the target group	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,454	R	Enable concretisation of their new business model through what collaborations they need in there business	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,46	R	Enable collective concretisation of their new business model through a circular business model canvas	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have

2,461	R	Include Add / Remove / Change operations (mutations) in the use of business model canvas	Enable practical transition steps	Smaller function	Lit. study/Visualizing Business Model Evolution with the Business Model Canvas	Could have
3	G	Ensure feeling of trust	Increase trust in the tool and its outcomes	Information	KJ-analysis/They want a digital tool/2 Cluster & Kinnarps	Must have
3,1	G	Show respect to the reality of the business	Increase trust in the tool and its outcomes	Information	KJ-analysis/They want a digital tool/1 Cluster	Must have
3,2	R	Include transparant and clear explanations	Increase trust in the tool and its outcomes	Information	KJ-analysis/They want a digital tool/1 Cluster	Must have
3,3	G	Ensure feeling of trust for the new business model within the business	Minimse worry within the company for the upcoming changes	Information	KJ analysis/The business feels a worry for new business models/4 Materia, Cluster, Ragnars, Kinnarps	Must have
4	G	Motivate its use and the transition	Increase internal understanding of why they should do this process	Information	KJ-analysis/Internal drive within the business is needed for change/6 All & Lit. Study/ "Designing the Business Models for Circular Economy—Towards the Conceptual Framework"	Must have
4,1	G	Motivate why circularity is necessary	Increase understanding of why it is important that they do the work	Information	KJ analysis/Positive attitude to circularity/2 Materia, Gemla	Should have
4,2	G	Motivate the use of this tool	Increase understanding of why they should use the tool	Information	KJ analysis/They want a digital tool/2 Cluster, Kinnarps	Must have
5	G	Enable understanding of the practical work of the new business model	Increase understanding of how they will work	Information	KJ-analysis/They have difficulties handling the practical parts after transitioning/6 All	Must have
5,1	R	Enable structuring of logistics depending on chosen strategy	Facilitate planning of practical logistics	Smaller function	KJ-analysis/They have difficulties handling the logistics/3 & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact. & Lit. Study/ "Circular economy: Factors affecting the financial performance of product take-back systems"	Should have
5,2	R	Enable structuring of manpower depending chosen strategy	Help planning of needed manpower	Smaller function	KJ-analysis/They have difficulties understanding the manpower needed/3 & Lit. Study/ "Circular economy: Factors affecting the financial performance of product take-back systems"	Should have
5,3	R	Inform of needed logistics	Increase understanding of practical logistics	Information	KJ-analysis/They have difficulties handling the logistics/3 & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.	Must have
5,4	R	Inform of needed manpower	Increase understanding of needed manpower	Information	KJ-analysis/They have difficulties understanding the manpower needed & missing working competencies in Competence is a limited factor/3	Must have
5,5	G	Include support for remanufacturing workflows	Facilitate planning of practical logistics	Information	Lit. study/Kans & Löfving (2023). Mirka2023 & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.	Must have
6	R	Offer guidance in the process of developing a new CBM	Ease the process of developing a new CBM	Function	KJ-analysis/To change business model is a complex process - Guidance helps work of change/ 2 Balzar and Kinnarps & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin	Must have

6,1	R	Include consultant within the guidance of the process	Reassure the users through the process of developing a new CBM	Function	<i>KJ-analysis/To change business model is a complex process - Guidance helps work of change/ 2 Balzar and Kinnarps</i>	Could have
6,11	R	Include AI consultant	Reassure the users through the process of developing a new CBM	Function	<i>KJ-analysis/To change business model is a complex process - Guidance helps work of change/ 2 Ragnars & Kinnarps & KJ-analysis/They want a digital tool/1 Balzar</i>	Could have
6,12	R	Include human consultant	Reassure the users through the process of developing a new CBM	Function	<i>KJ-analysis/To change business model is a complex process - Guidance helps work of change/ 3 Ragnars, Kinnarps & Materia</i>	Won't have
6,2	R	Enable framework-following support	Reassure the users through the process of developing a new CBM	Information	<i>CitkuTrä/RE:Furn scope & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Software tools for business model innovation: current state and future challenges</i>	Must have
7	R	Include connections to regulations relevant for the chosen strategy	Simplifies work with regulations	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity/ 2 Balzar and Kinnarps & "KJ-analysis/They want a digital tool & Lit. study/Svenskt Trä, Trämöbler & Lit. Study/ "Circular economy: Factors affecting the financial performance of product take-back systems" /1 Kinnarp" & Lit. study/En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling</i>	Should have
7,1	R	Inform about relevant regulations regarding upcoming DPP	Simplify the future transition of starting to use the upcoming systems for DPP	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity/ 2 Balzar and Kinnarps & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Should have
7,2	R	Inform about relevant certificates (ISO, Möbelfakta , (Svanen, EU, Ecolabel), etc)	Help the understanding of the work of certificates	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity/ 2 Balzar and Kinnarps & Lit. study/Svenskt Trä, Trämöbler</i>	Should have
7,3	R	Inform about EPD	Help the understanding of the work of EPDs	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity/ 2 Balzar and Kinnarps</i>	Could have
7,4	R	Inform about what is needed to fulfill the relevant regulations	Help the understanding of the work with regulations	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity - regulations demands a lot of work/ 2 Balzar and Kinnarps & Lit. study/Svenskt Trä, Trämöbler</i>	Won't have
7,41	R	Provide the companies with the relevant regulations' systems	Simplify the work of regulations	Information	<i>KJ analysis/Businesses use different systems-They retrieve regulations through respective regulator system/</i>	Won't have

8	R	Enable following the product's full life cycle	Enables learning from product's use and contributing to its longer life	Function	<i>KJ-analysis/To change business model is a complex process - They want to be included in the entire life cycle/ 2 Balzar and Kinnarps & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Svenskt Trä, Snickerihandbok</i>	Could have
9	R	Include visual change feedback	Faster understanding and correct actions when using the tool	Smaller function	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Must have
9,1	R	Include visual change feedback in business model canvas (add/change/remove)	Faster understanding and correct actions when using the tool	Smaller function	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Should have
10	G	Adaptable to DPP's system	Enable integration and systematisation of DPP	Design	<i>KJ-analysis/They want a digital tool/2 Kinnarps & Balzar & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Should have
11	G	Connect how the company's possibilities can increase customer value	Help increased customer appreciation	Information	<i>KJ-analysis/ Customer value is important to the companies/All & Lit.study/En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling & "Designing the Business Models for Circular Economy—Towards the Conceptual Framework"</i>	Should have
11,1	R	Communicate environmental footprint of the new CBM	Help understanding of transition's results	Information	<i>KJ-analysis/ Customer value is important to the companies/2 Kinnarps, Balzar</i>	Should have
11,2	R	Help communicate results related to customer value	Help increased customer appreciation	Information	<i>KJ-analysis/ Customer value is important to the companies/4 Kinnarps, Balzar, Djerf, Ragnars</i>	Should have
11,3	R	Include sustainability metrics dashboard of new business model during development	Ease the understanding of the new CBM results	Function	<i>Lit. study/EEB, Cirkulär Trä PP</i>	Could have
12	G	Enable comparison between business models before and after transition	Enable clear steps for progress	Information	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Should have
12,1	G	Highlight the changes from the transition	Enable clear steps for progress	Information	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Should have
12,2	G	Highlight the changes where focus is needed	Enable clear steps for progress	Information	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Could have
12,3	G	Include alerts and guidance for high-priority actions for transitioning	Enable clear steps for progress	Function	<i>Lit. study/Mirka2023, KansLöfving2023</i>	Should have
13	G	Work as unified platform for the businesses stakeholder	Enables use of multiple stakeholders simultaneously	Smaller function	<i>KJ-analysis/They want a digital tool</i>	Could have
13,1	G	Enable collaborative modeling in the development of the new CBM	Enable shared sensemaking and aligned action	Smaller function	<i>Lit. study/Software tools for business model innovation: current state and future challenges</i>	Could have
13,2	G	Enable commenting and annotation	Enable shared sensemaking and aligned action	Smaller function	<i>Lit. study/Software tools for business model innovation: current state and future challenges</i>	Could have
13,3	G	Include a collaboration & communication module	Enable shared sensemaking and aligned action	Smaller function	<i>Lit. study/Kans & Löfving (2023), Mirka2023</i>	Could have
14	R	Highlight on where expenses can be minimised	Helps prioritise decisions from economics	Information	<i>KJ-analysis/SMEs have more difficulty with money/4 Balzar, Gemla, Kinnarps, Ragnars</i>	Should have

15	R	Include external methods (e.g. BMC, Value proposition canvas, asset management system)	Increase trust in tool with recognised methods	Smaller function	<i>KJ-analysis/They want a digital tool/2 Kinnarps, Ragnars</i>	Could have
15,1	G	Comparison of different external methods	Improve better choices and stronger strategies	Information	<i>Lit. study/Software tools for business model innovation: current state and future challenges</i>	Could have
15,2	R	Support multi-framework process	System scalability and multiple ways of working	Smaller function	<i>Lit. study/Software tools for business model innovation: current state and future challenges</i>	Could have
15,3	R	Enable Integration with external databases (materials, suppliers)	System scalability and multiple ways of working	Smaller function	<i>Lit.study/Circularise blog, Kans & Löfving</i>	Could have
16	G	Support internal and external community/network	Enable peer learning and shared knowledge within the business	Function	<i>Lit. study/Implementation of Circular Economy Business Models by SMEs</i>	Could have
16,1	G	Enable external collaboration between companies	Increase circularity from companies to business	Smaller function	<i>KJ-analysis/They want a digital tool/1 Balzar</i>	Could have
16,2	G	Encourage knowledge-sharing spaces	Enable peer learning and shared knowledge within the business	Information	<i>Lit. study/Implementation of Circular Economy Business Models by SMEs</i>	Could have
16,3	G	Include support to internally communicate change	Enable peer learning and shared knowledge within the business	Smaller function	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin</i>	Could have
17	R	Enable usage of the tool after development of new business model	Increase trust in tool and the process	Function	<i>KJ-analysis/They want a digital tool/ 2 Cluster/Ragnars</i>	Could have
17,2	R	Show progression status in transition to new CBM after development	Minimise cognitive load and maximise user confidence	Information	<i>Lit. study/Software tools for business model innovation: current state and future challenges & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin</i>	Won't have
17,3	R	Enable integration of leasing/service models	Ease the process of developing a new CBM	Smaller function	<i>Lit. study/KansLöfving2023, CirkuTrä PP</i>	Won't have
18	G	Make process of CBM development easily followed	Ease the process of developing a new CBM	Information	<i>KJ-analysis/To change business model is a complex process/All</i>	Must have
18,1	R	Include stepwise transition structure	Minimise cognitive load	Function	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin</i>	Should have
18,11	R	Process include steps based on users' reality	Ensure possibility of implementation in reality	Information	<i>KJ-analysis/To change business model is a complex process/1 Cluster (indirekt alla)</i>	Could have
18,2	R	Show progression in development of CBM	Minimise cognitive load	Information	<i>Lit. study/Software tools for business model innovation: current state and future challenges & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Implementation of Circular Economy Business Models by SMEs</i>	Should have
19	R	Encourage systematized production structure	Ease the practical work of the new CBM	Information	<i>KJ-analysis/They need systematics/All & Lit. study/En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling</i>	Should have
19,1	R	Help development of who does what	Ease the practical work of the new CBM	Smaller function	<i>KJ-analysis/They need systematics/All</i>	Could have
19,2	R	Help development of what steps are needed in production	Ease the practical work of the new CBM	Smaller function	<i>KJ-analysis/They need systematics/All</i>	Could have
19,3	R	Help development of what material is needed	Ease the practical work of the new CBM	Smaller function	<i>KJ-analysis/They need systematics/All</i>	Could have
20	R	Help understanding of necessary action when growth in demand occurs	Increase understanding of needed adjustments	Information	<i>KJ-analysis/Higher demand meand adjustment of larger scale/2 Kinnarps & Ragnars</i>	Should have
21	G	Support SMEs	Increase real-world usability	Information	<i>Lit. study/Implementation of Circular Economy Business Models by SMEs</i>	Must have

21,1	R	Comply to low frequency of joint meetings within the company	Enables work without changing company's meeting structure	Information	KJ-analysis/They rarely have meetings regarding circularity/1 Balzar	Should have
22	R	Development process should stem from the current business model	Ensure possibility of implementation in reality	Function	Scope & KJ-analysis/To change business model is a complex process - there are always improvements possible/ All exc Ragnars & Lit. study/Kans & Löfving (2023), CirkuTrä PP	Must have
22,1	R	Enable evaluation of new CBM for potential improvements	Ensure possibility of continued work	Function	KJ-analysis/To change business model is a complex process - there are always improvements possible/ All exc Ragnars & Lit. Study/ "CHALLENGES OF THE INTRODUCTION OF CIRCULAR BUSINESS MODELS WITHIN RURAL SMES OF EU"	Could have
23	R	Demand little time of the company's everyday work	Enables work without changing company's working structure	Function	KJ-analysis/Time is a limited factor/All	Should have
24	R	make process of CBM development easily followed	Sets reasonable demands and expectations for the process	Information	KJ-analysis/Time is a limited factor & To change business model is a complex process - It takes time to switch /All & Cluster, Kinnarps, Ragnars	Must have
25	R	Get examples and inspiration of others' transitions	Facilitates ideas and trust for a new CBM	Information	KJ analysis/They get inspired from others' CBMs/4 Balzar, Cluster, Materia, Ragnars	Must have
26	G	Bring an understanding why it's worth it for the business	Increase trust in the new CBM	Information	KJ-analysis/SMEs have more difficulty with money/4 Balzar, Gemla, Kinnarps, Ragnars	Must have
26,1	R	Present economic effect of new business model to the company	Increase understanding and trust in the new CBM for the company's gain	Information	KJ-analysis/SMEs have more difficulty with money/4 Balzar, Gemla, Kinnarps, Ragnars & KJ-analysis/Business focus on economic growth/All	Must have
27	R	Include educations or educating material	Increases understanding and facilitates ideas for new CBMs	Information	KJ analysys/Appriciates new perspectives/1 Ragnars & Lit. study/Kans & Löfving (2023), Gemla Möbler case & "CHALLENGES OF THE INTRODUCTION OF CIRCULAR BUSINESS MODELS WITHIN RURAL SMES OF EU"	Could have
27,1	G	Encourage community learning spaces	Foster knowledge exchange for faster adoption	Information	Lit. study/Implementation of Circular Economy Business Models by SMEs	Could have
28	R	Enable understanding of rotated roles in the new business model	Minimise worry within the company for the upcoming changes	Information	KJ analysis/The business feels a worry for new business models/1 Kinnarps	Could have
29	R	Ensure that the process is adjustable to their available resources	Ease work in deciding upon new CBM	Function	KJ analysis/Limited to the business possibilities/6 all	Should have
29,1	R	Enable action-oriented interaction related to entered data	Ease work in deciding upon new CBM	Function	Lit. study/Visualizing Business Model Evolution with the Business Model Canvas	Must have
30	R	Enable easy extraction of information for analogue presentation and discussion	Enable analogue discussion and presentation	Smaller function	KJ analysis/Businesses use different systems-Businesses discuss analogue and digital/1 Balzar (fler pratat om det men ej där)	Could have
31	G	Enable following the market's circularity	Ensure relevance in chosen business model	Information	KJ-analysis/To change business model is a complex process - Follows the development of circularity/ All & & Lit. Study/ "CHALLENGES OF THE INTRODUCTION OF CIRCULAR BUSINESS MODELS WITHIN RURAL SMES OF EU"	Won't have

31,1	R	Enable following customer needs	Ensure relevance for the in chosen business model	Information	<i>KJ-analysis/ Customer needs control the market/All & Lit. study/DESIGN FÖR DEMONTERING TILLÄMPAT PÅ KONTORSMÖBLER</i>	Won't have
31,2	R	Include benchmarking against industry best practices	Enable comparison with circular businesses	Information	<i>Lit. study/Mirka2023, Drott & Örnekvist (2026)</i>	Could have
31,2	R	Include analysis of market demand	Improve product-market fit	Information	<i>Lit. study/TMF, Möbelförbundet, 2018</i>	Could have
31,3	R	Include large enterprise benchmarking	Enable comparison with circular businesses	Information	<i>Lit. study/EU SME Definition</i>	Won't have
32	R	Enable customer contact	Help inclusion in the product's full life cycle	Function	<i>KJ-analysis/Companies want more contact with customers/All & Lit. study/ "Designing the Business Models for Circular Economy—Towards the Conceptual Framework"</i>	Could have
32,1	R	Enable knowing who has their sold products	Help inclusion in the product's full life cycle	Function	<i>KJ-analysis/Want to be able to track forwards/2 Djerf & Kinnarps</i>	Could have
32,2	R	Enable retrieving their products at the end of their life cycle	Ease prolonging product's lifespan	Function	<i>KJ-analysis/Want to be able to track forwards/3 Djerf, Balzar & Kinnarps</i>	Could have
32,3	G	Help understand customer needs through customer contact	Ease business' relevance	Function	<i>KJ-analysis/ Customer needs control the market/Djerf</i>	Won't have
33	G	Help increase knowledge of circularity within the company	Increase understanding of transition and its worth	Information	<i>KJ-analysis/Missing knowledge of circularity in Competence is a limited factor/4 Djerf, Ragnars, Balzar & Cluster</i>	Must have
33,1	G	Increase knowledge about circular economy	Bridge knowledge gap och circular economy	Information	<i>Lit. study/Kartläggning Mirka Kans, Malin Löfving</i>	Must have
33,2	G	Increase knowledge about remanufacturing of furniture	Bridge knowledge gap och circular economy	Information	<i>Lit. study/Kartläggning Mirka Kans, Malin Löfving & "Hållbarhetsanalys av cirkulära möbelflöden"</i>	Must have
34	R	Focus on adding an additional business model instead of a full switch	Ease starting point of transition	Information	<i>KJ-analysis/They see CBM as a side track/All</i>	Must have
35	G	Offer something the company cannot do without it	Ensure the necessity of the tool	Function	<i>KJ-analysis/They want a digital tool /1 Cluster</i>	Must have
36	R	Inform of the importance of marketing	Increase market recognition of company	Information	<i>KJ-analysis/Marketing is important/5 all except Cluster & Lit. study/En Cirkulär Möbelförbundet - Affärsmodellens betydelse i Materias hållbara utveckling</i>	Should have
36,1	R	Help with structure for future marketing	Ease decision on marketing focus	Function	<i>KJ-analysis/Marketing is important/5 all except Cluster</i>	Could have
37	R	Highlight important steps in the business model and when they should be done depending on chosen strategy	Ease the practical work of the new CBM	Information	<i>KJ analysis/Earlier assessment of condition helps logistic/3 Materia, Balzar, Kinnarps</i>	Could have
37,1	R	Enable understanding of when a first assessment of remanufacturing a furniture should be done	Minimize company's time and effort in process of remanufacturing	Information	<i>KJ analysis/Earlier assessment of condition helps logistic/3 Materia, Balzar, Kinnarps</i>	Won't have
37,2	R	Enable understanding of how to learn from their products' damages from use	Ease the practical work of the new CBM	Information	<i>KJ analysis/Product quality is important/3 Gemla, Balzar, Kinnarps</i>	Could have
37,3	G	Include support for modular product assessment & decision-making	Ease the practical work of the new CBM	Smaller function	<i>Lit. study/CirkuTrä PP, Gemla Möbler case; & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Could have
38	R	Highlight benefits and drawbacks of all strategies to choose from	Ease decision of strategy	Information	<i>KJ analysis/Product quality is important/3 Gemla, Balzar, Kinnarps</i>	Should have

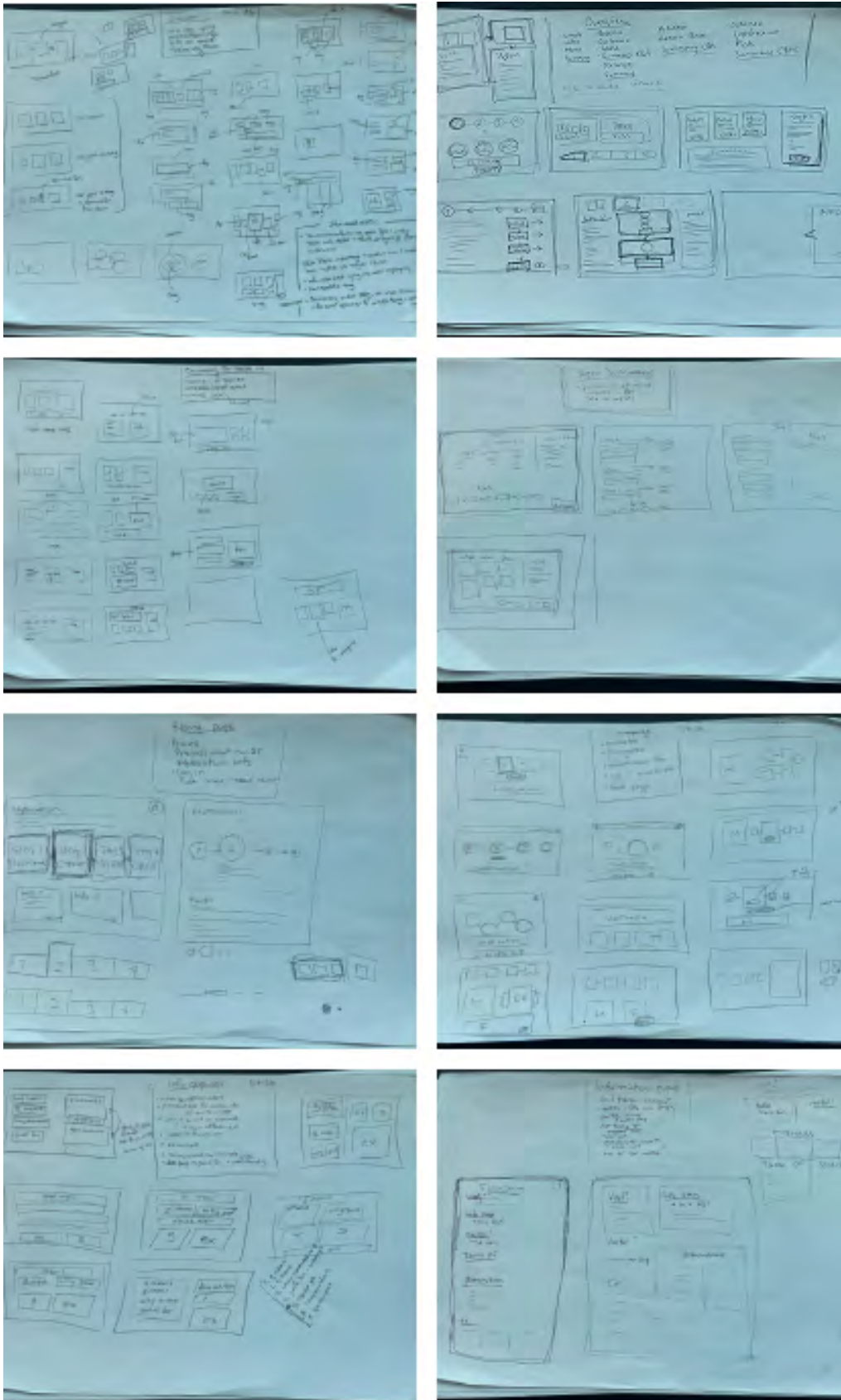
38,1	R	Highlight benefits of product quality to extend product life cycle	Increase understanding of quality importance	Information	<i>KJ analysis/Product quality is important/3 Gemla, Balzar, Kinnarps & Lit. study/Svenskt Trä, Snickerihandbok & Lit. Study/ "Challenges of the introduction of circular business models within rural SMEs of EU"</i>	Could have
38,2	R	Highlight benefits of of modularity to extend product life cycle	Increase understanding of modularityimportance	Information	<i>Lit. study/Hållbarhetsanalys av cirkulära möbelflöden & KJ analysis/Product quality is important/3 Gemla, Balzar, Kinnarps</i>	Could have
39	R	Enable understanding of which stakeholders need to be involved in transition	Include all relevant stakeholders	Information	<i>KJ-Analysis/Several stakeholders are involved in transition/All</i>	Should have
39,1	R	Enable understanding of which external stakeholders need to be involved in transition	Include relevant external stakeholders	Information	<i>KJ-Analysis/Several stakeholders are involved in transition/5 All ex Gemla</i>	Should have
39,2	R	Enable mapping of supply chain network	Smoother circular adoption	Smaller function	<i>Lit. study/TMF, 2020</i>	Won't have
39,3	R	Enable understanding of which internal stakeholders need to be involved in transition	Include relevant internal stakeholders	Information	<i>KJ-Analysis/Several stakeholders are involved in transition/Balzar, Gemla, Kinnarps</i>	Should have
40	R	Adaptable to different digital systems	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/All</i>	Should have
40,1	R	Adaptable to different internal business systems	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/3 Cluster, Kinnarps, Gemla</i>	Could have
40,2	R	Adaptable to Office365	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/5 Cluster, Materia, Gemla, Balzar, Ragnars</i>	Should have
40,21	R	Adaptable to Teams	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/1 Cluster</i>	Should have
40,22	R	Adaptable to Excel	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/4 Materia, Gemla, Cluster, Balzar</i>	Should have
40,23	R	Adaptable to Sharepoint	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/1 Materia</i>	Should have

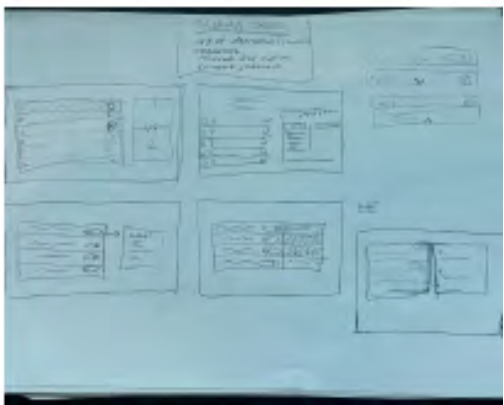
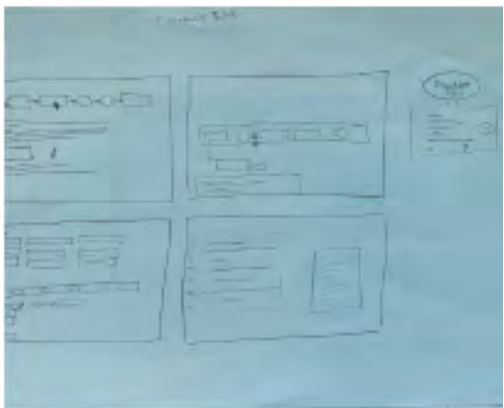
C

Initial Braindrawing Session

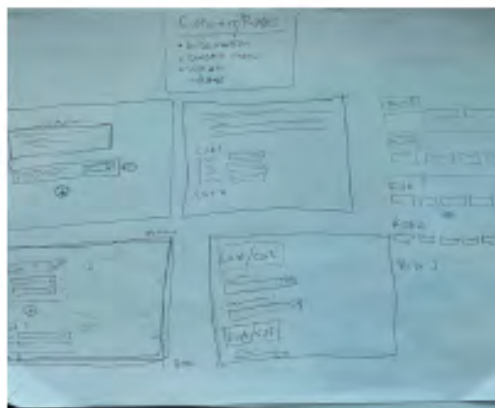
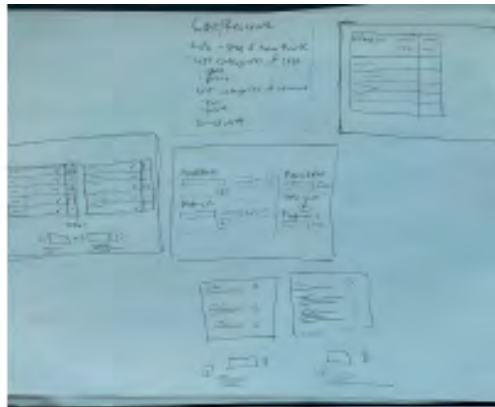
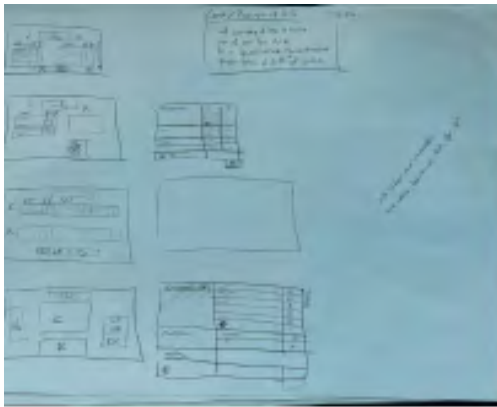
This appendix includes the drawings resulting from the initial braindrawing session in the Contextual phases. They are divided into pairs regarding the same frames. The aim was to ideate around layout and flow of the tool without attention to details.

C. Initial Braindrawing Session





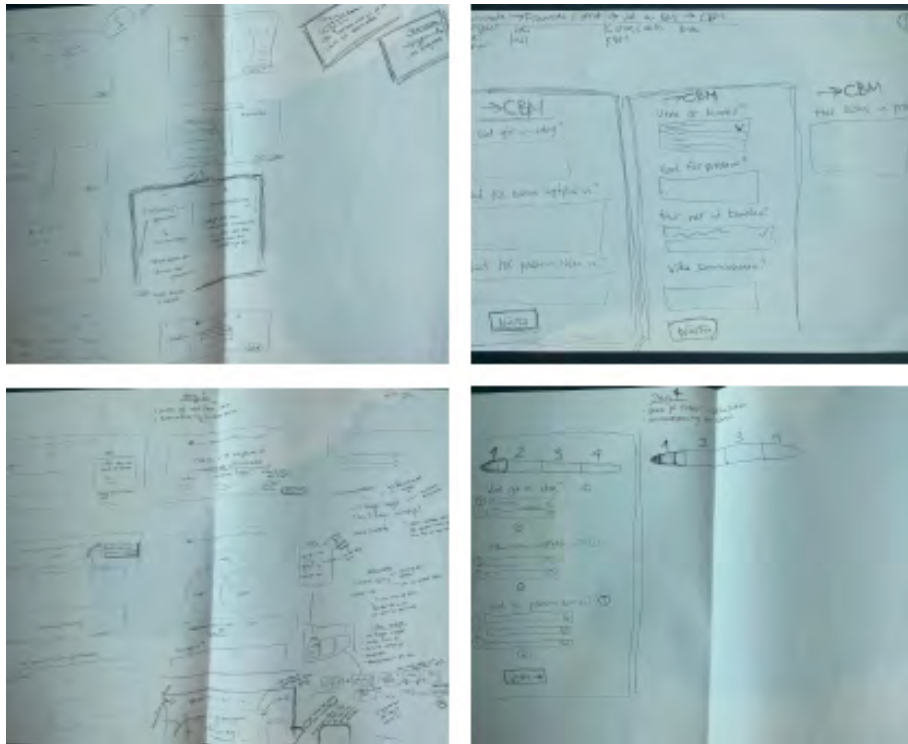
C. Initial Braindrawing Session



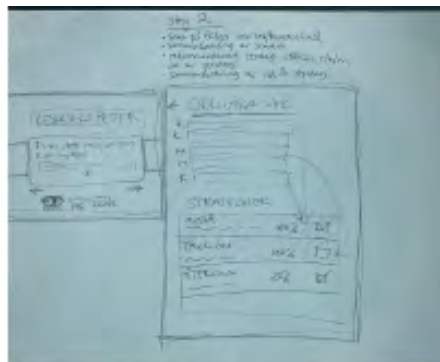
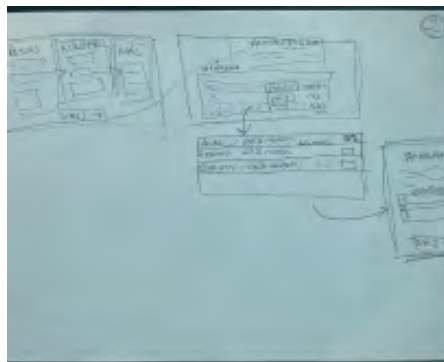
D

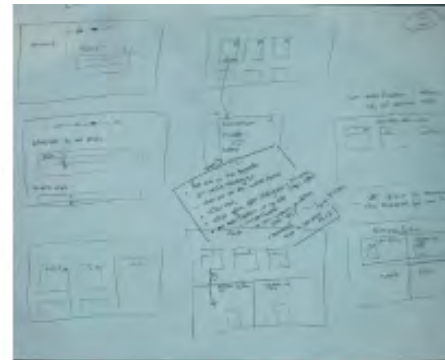
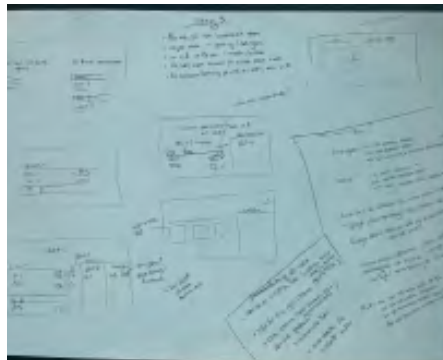
Second Braindrawing Session

This appendix includes the drawings resulting from the second braindrawing session in the Contextual phases. They are divided into pairs regarding the same frames, where focus were on the four steps within the tool. The aim was to ideate around layout and flow of the tool without attention to details. At the end, a list of what each frame should include is presented, a result from the initial braindrawing that served as a base of the second braindrawing.

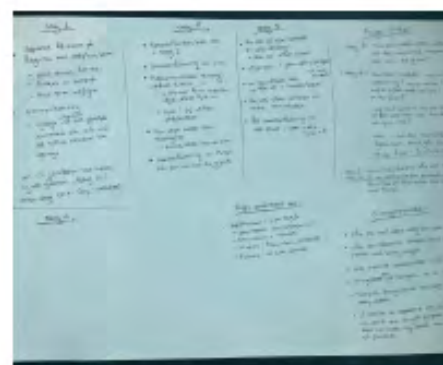
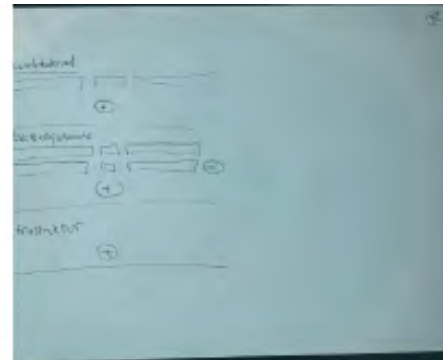
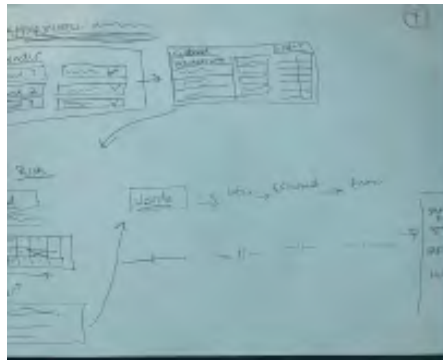


D. Second Braindrawing Session





D. Second Braindrawing Session



E

Low-Fidelity Prototype

This appendix includes the frames from the low-fidelity prototype showing the level of fidelity with layouts and placeholders. They are presented with descriptive figure texts. They worked as an initial base to continue the development of the prototype, and clearer views of the tool in its final form are presented in Appendix J.

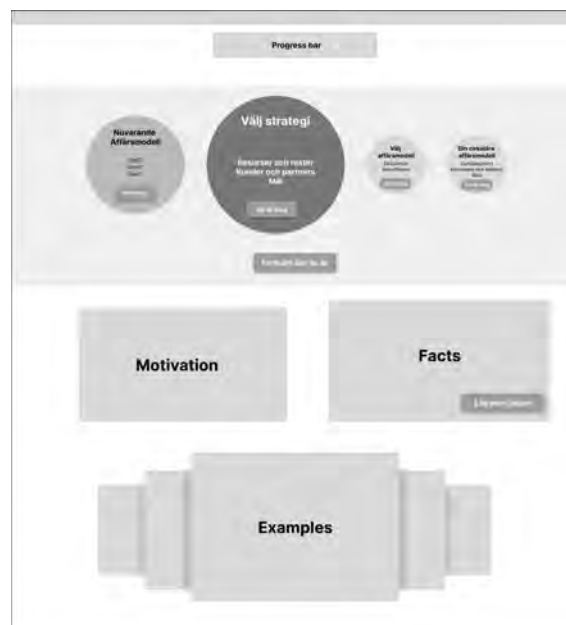


Figure E.1: Home page in its extended form in the low-fidelity prototype

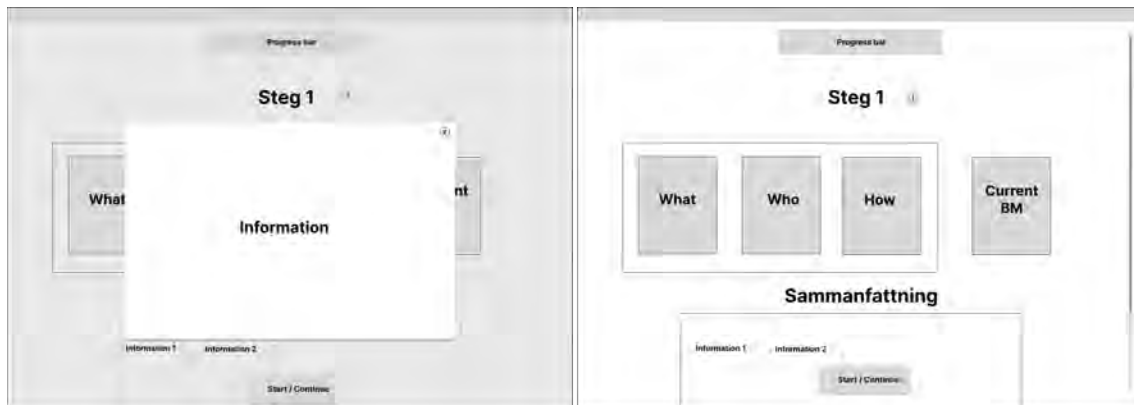


Figure E.2: The initial reach of a step's overview with information pop-up, and when the pop-up is closed in the low-fidelity prototype

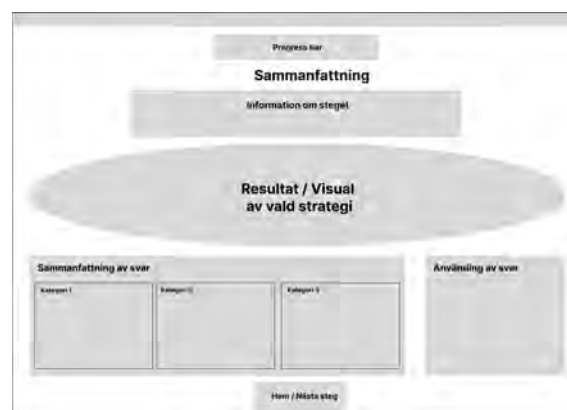


Figure E.3: The layout of the summary of a step in the low-fidelity prototype

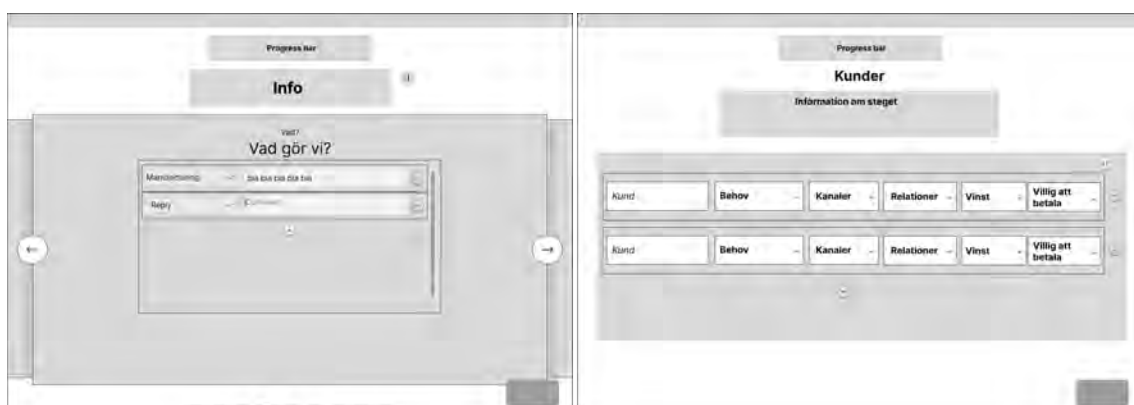


Figure E.4: The carousel cards when entering data in Step 1 and Step 2 and the layout of handling entry-lists in the low-fidelity prototype

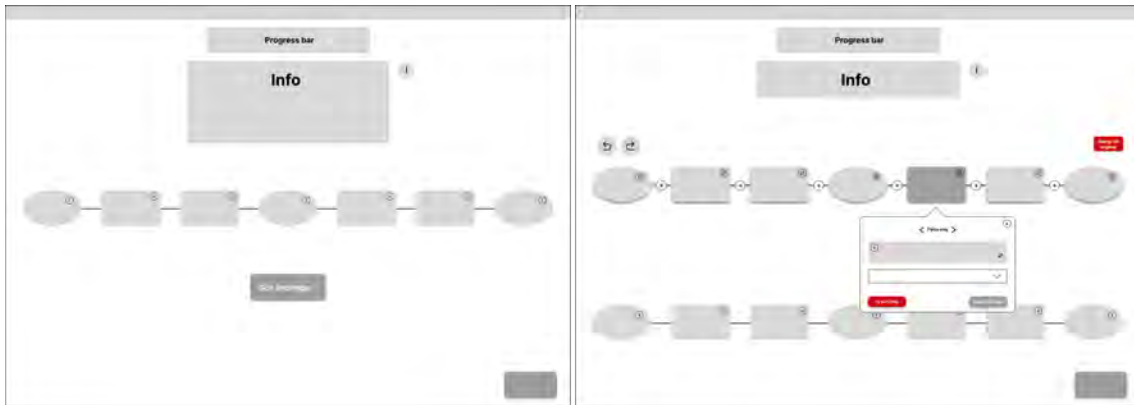


Figure E.5: Layout for where the user can choose to change the generated value chain and how they change it in the low-fidelity prototype



Figure E.6: The layouts of the non-entry lists in the low-fidelity prototype - the first one has the action to compare, the second one to delegate and the third to choose one or several

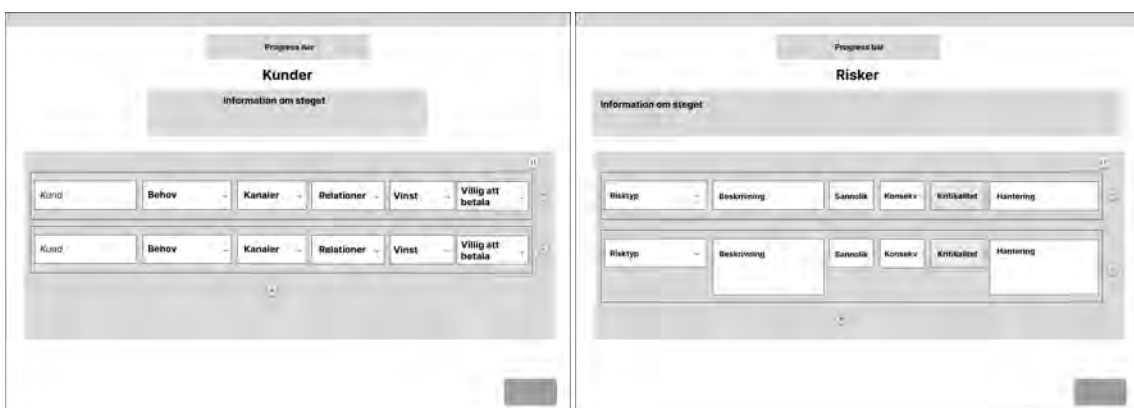


Figure E.7: The layouts of the entry lists for customers and risks in the low-fidelity prototype

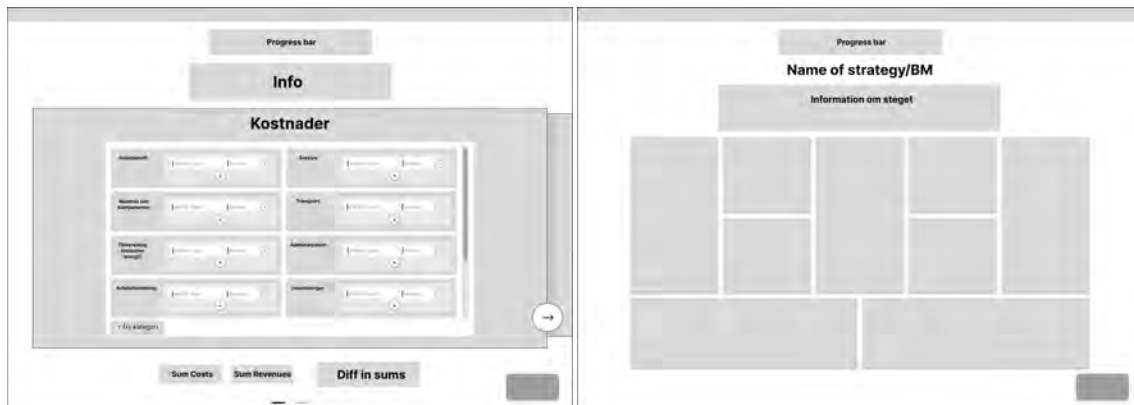


Figure E.8: The layouts of the costs and revenue entries and the generated Circular Business Model Canvas in the low-fidelity prototype

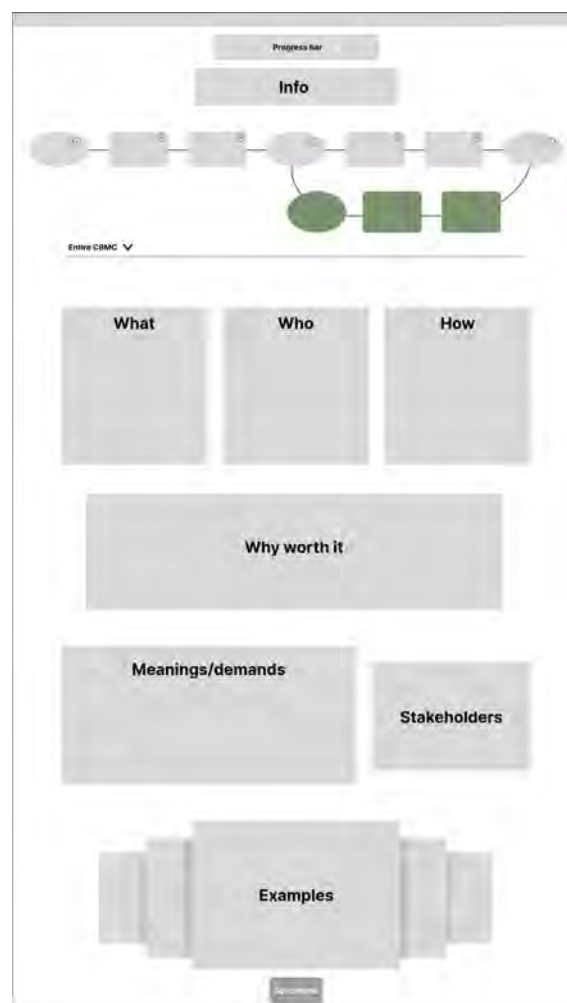


Figure E.9: The layouts of the final summary in the low-fidelity prototype

F

Initial High-fidelity Prototype

This appendix includes the frames from the initial high-fidelity prototype showing the level of fidelity with layouts and design elements. They are presented with descriptive figure texts. They worked as an initial base to continue the development of the prototype and clearer views of the tool in its final form are presented in Appendix J.



Figure F.1: Home page in its extended form in the high-fidelity prototype

F. Initial High-fidelity Prototype

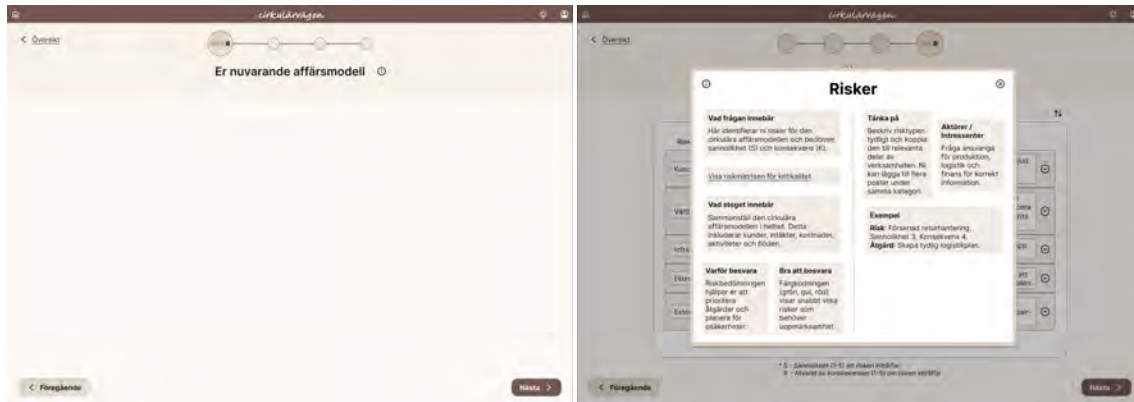


Figure F.2: Representation of the global elements in the tool

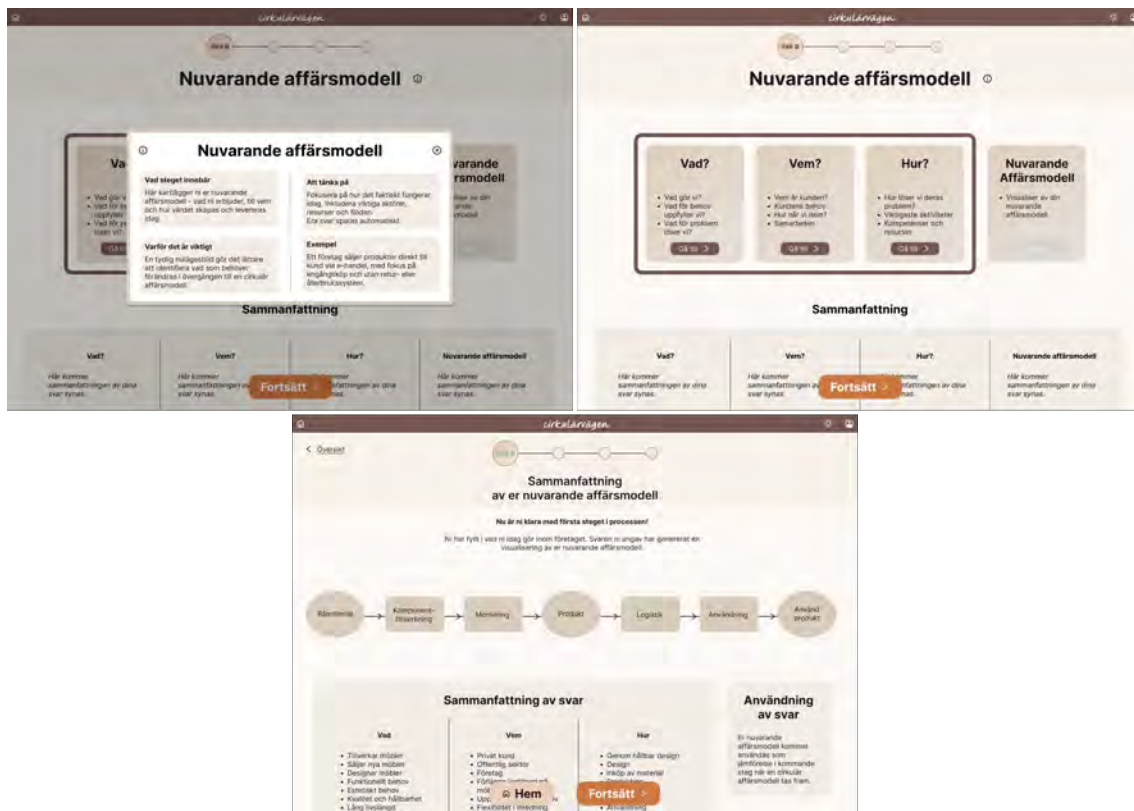


Figure F.3: The overview and summary of the first step in the high-fidelity prototype

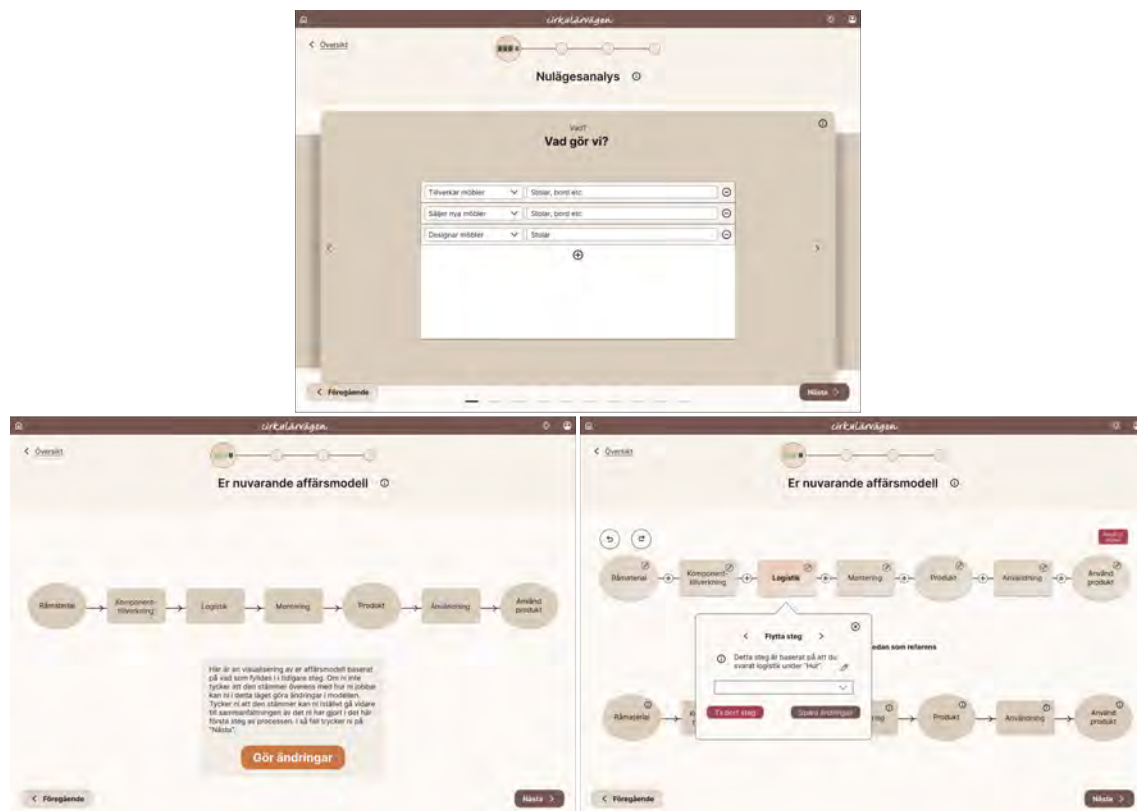


Figure F.4: The tasks within the first step in the high-fidelity prototype

F. Initial High-fidelity Prototype

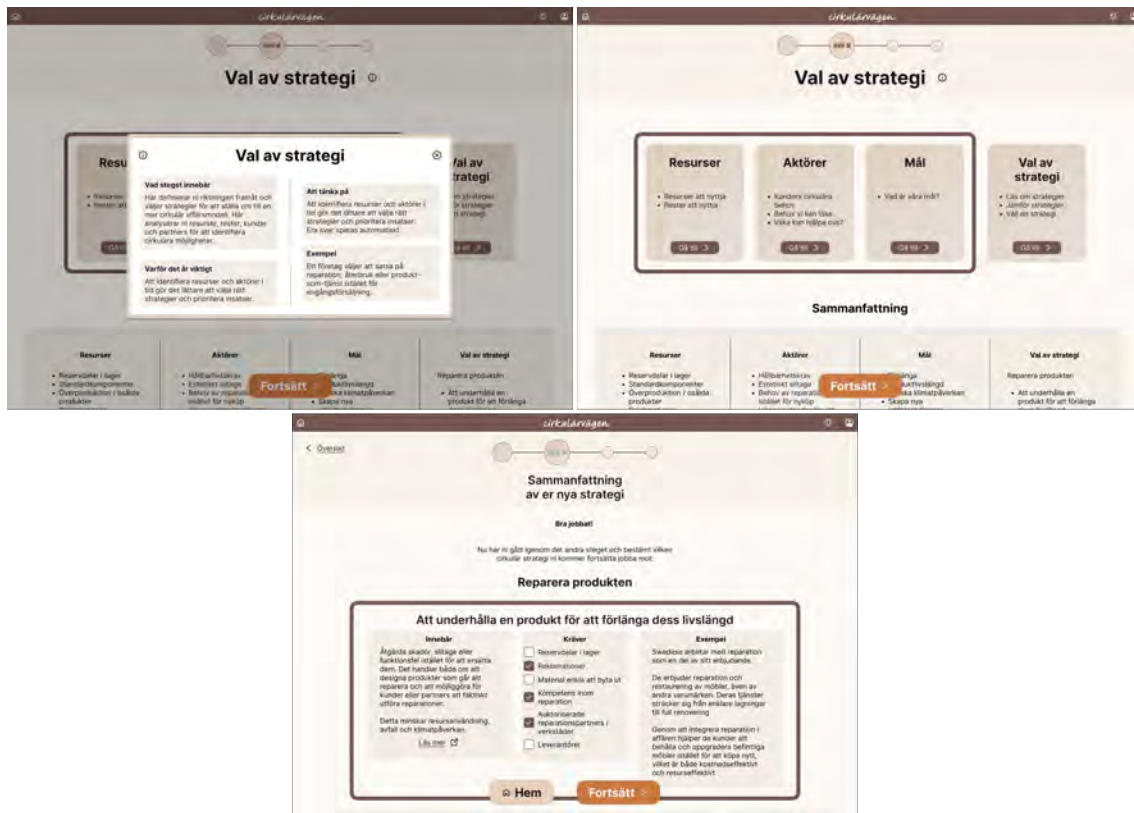


Figure F.5: The overview and summary of the second step in the high-fidelity prototype

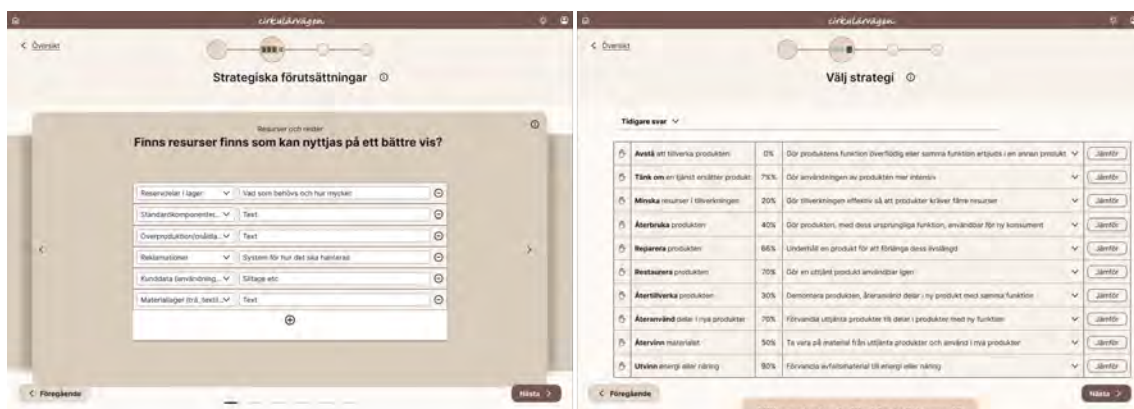


Figure F.6: The tasks within the second step in the high-fidelity prototype

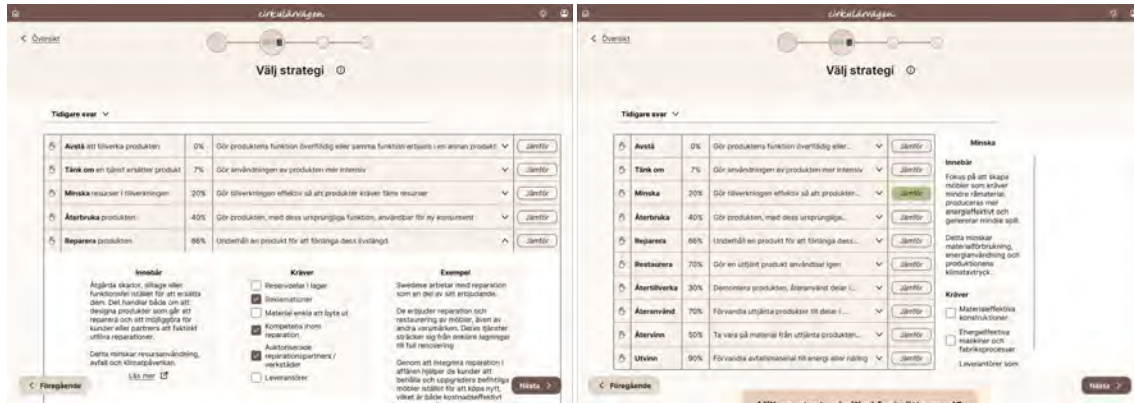


Figure F.7: The actions made through interactions of the strategy list in the second step of the high-fidelity prototype



Figure F.8: The overview and summary of the third step in the high-fidelity prototype

F. Initial High-fidelity Prototype

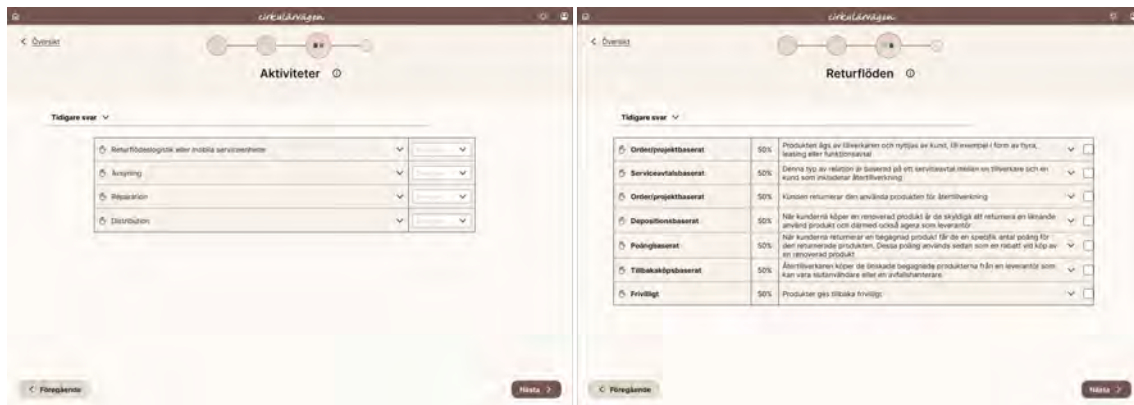


Figure F.9: The tasks within the third step in the high-fidelity prototype

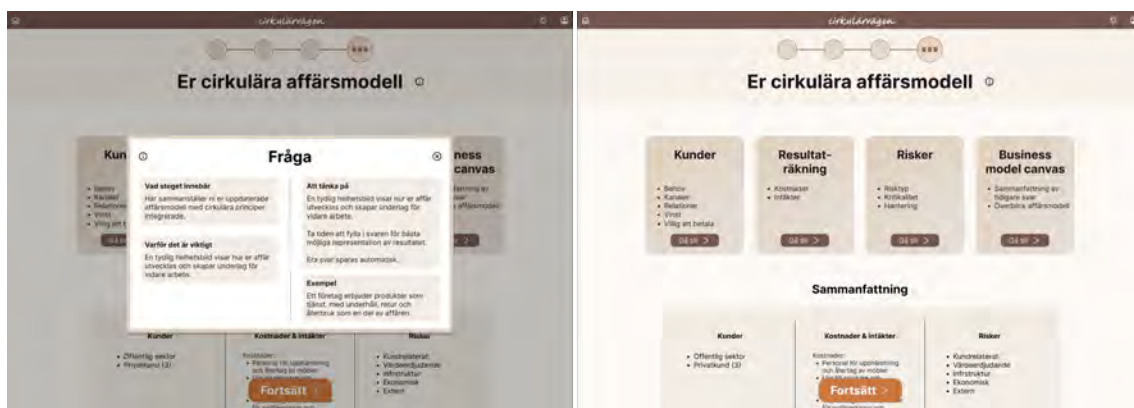


Figure F.10: The overview of the fourth step in the high-fidelity prototype

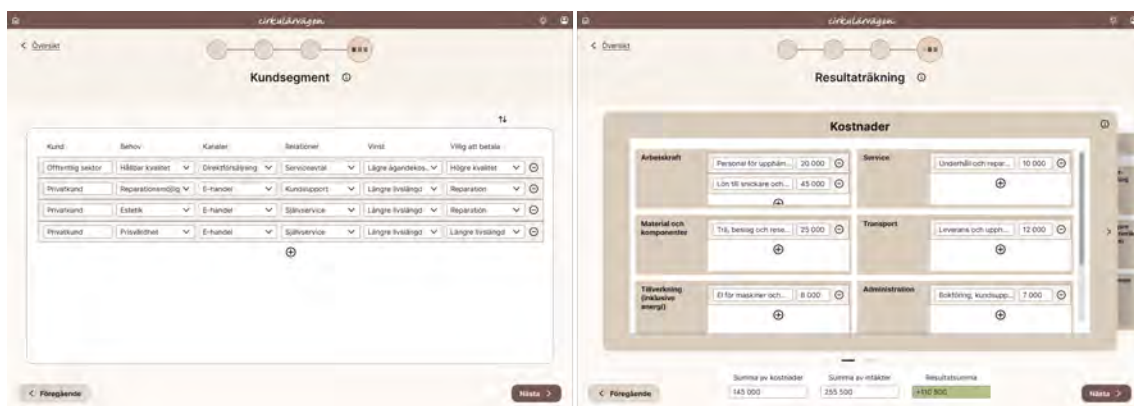


Figure F.11: The first two tasks within the first step in the high-fidelity prototype

Figure F.12: The last two tasks within the first step in the high-fidelity prototype

Figure F.13: Representation of how a change from the CBMC would generate actions within the interface

Figure F.14: The final summary in the high-fidelity prototype



Figure F.15: The home page after being done with a process in the high-fidelity prototype

G

Categories Emerged from KJ Analysis after Usability Tests

This appendix includes the categories emerged from the second KJ analysis following the usability tests. They are divided into main categories, subcategories and subsubcategories. Each category has numbers in brackets indicate the number of expressions/post-its followed by the number of participants contributing to that category. Counts for main categories include all expressions within their underlying subcategories and sub-subcategories. They are sorted from most to least amount of expressions/post-its included in the category.

Main category	Subcategory	Sub-subcategory
Need for greater interface clarity [72/3]	Appreciates clarity within the execution of the tasks [22/3]	Appreciates clarity in what the question means [6/3]
		Appreciates clarity within how the interface should be handled [5/1]
		Appreciates clarity in what answers should be filled out [3/2]
		Appreciates clarity in the results [2/2]
	Needs clarity among what interactions do [22/3]	Needs clarity among which are clickable elements [6/1]
		Visual clarity needs for interaction [2/2]
	Needs clarity of the meaning among the interactive elements of the interface [12/3]	Lacking clarity in navigation [2/1]
Missing information in the tool [47/3]	Lacking trust in information and content [12/3]	Lacking trust in chosen methods and their content [4/2]

Main category	Subcategory	Sub-subcategory
		Lacking trust to the information about strategies [4/2]
		Lacking trust to what the information is based on [3/1]
	Wants to understand what the strategy means in practice [10/1]	Doesnt know what the different strategies means in offering services [2/1]
	Wants to know whats needed besides the tools contributions [8/3]	
	Regulations are important to include [6/1]	
	Wants information of environmental saving from the different strategies [5/3]	
	Wants information to map strategies [5/1]	
Appreciation for visualization [21/3]	Wants even more visualized [6/3]	
	Wants more dynamic BM visualization [3/2]	
	Wants clearer BM visualization [2/1]	
	Wants clear division of information [2/1]	
Want to prioritize among strategies [15/3]	Wants to prioritize among relevant strategies [10/2]	
	Wants to cross out irrelevant strategies [5/3]	
Trusts the tool [13/3]		
Appreciation for summaries [12/3]	Needs the summary to be able to understand what others have replied [8/2]	
Understands the tool [11/3]	Understand the information [3/3]	
	Understand what theyve done [3/2]	
Good to enable different ways of using the tool [11/2]	Good to enable different ways of interacting [8/2]	
	Good to enable different ways of navigating [2/2]	

Main category	Subcategory	Sub-subcategory
Multiple ways of editing the business model is appreciated [10/3]	Wants drag-and-drop [4/3]	
	Wants to be able to delete, add and copy [4/3]	
Took their time [8/3]		
Wants to work with several strategies in one process [6/3]		

H

Requirements and Guidelines after Usability test

This appendix includes the list of requirements and guidelines formed in the Usability phase. They emerged following the usability tests, from the KJ categories available in Appendix G. They were prioritized using MoSCoW, with 'Must haves', 'Should haves', 'Could haves', and 'Won't haves'. They were also divided into the categories: information, design, functions, and smaller functions. They are presented in numerical order where the sources are fully visible for traceability.

ID	R / G	Description	Cause/effect	Category	Source	Prioritization
41	R	Inform about improved carbon foot print when choosing between strategies	Help understanding of transition's results	Information	KJ analysis 2/Missing information in the tool/3 Kinnarps, Gemla, Ragnars	Should have
42	R	Include information about regulations	Simplifies understanding of needed regulations	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Should have
42,1	R	Include information about regulations when choosing between strategies	Simplifies understanding of needed regulations	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Should have
42,2	R	Include information about regulations when in the summary	Simplifies understanding of needed regulations	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Should have
42,3	R	Enclose information about regulations in its own space in the interface	Simplifies readability of needed regulations	Design	KJ analysis 2/Appreciation for visualization/1 Ragnars	Should have
43	R	Inform of what the strategy would mean in practice	Increase understanding of how they will work	Information	KJ analysis 2/Missing information in the tool/1 Gemla	Must have
43,1	R	Inform of what services they need to offer with each strategy	Increase understanding of how they will work	Information	KJ analysis 2/Missing information in the tool/1 Gemla	Must have
43,2	R	Inform about logistics needed	Increase understanding of how they will work	Information	KJ analysis 2/Missing information in the tool/1 Gemla	Must have
43,3	G	State clear differences between strategies	Increase understanding of strategies	Information	KJ analysis 2/Missing information in the tool/1 Gemla	Must have
44	R	Include external methods	Enable peer learning and shared knowledge within the business	Information	KJ analysis 2/Missing information in the tool/3 Kinnarps, Gemla, Ragnars	Should have
44,1	R	Include use of workshop to execute the tasks	Enable peer learning and shared knowledge within the business	Information	KJ analysis 2/Missing information in the tool/1 Ragnars	Should have
44,2	R	Include next step of process of transition	Ease transition after development	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Should have
45	R	Inform of multiple ways of thinking and doing the tasks	Increase understanding of what is expected of the user	Information	KJ analysis 2/Missing information in the tool/1 Gemla	Should have
45,1	R	Inform of what the cost/revenue should cover	Understand how to think when entering costs/revenues	Information	KJ analysis 2/Missing information in the tool/1 Gemla	Should have
46	G	Increase trust in the information regarding different strategies	Minimise worry within the company for the upcoming changes	Information	KJ analysis 2/Missing information in the tool/2 Kinnarps, Gemla	Must have
46,1	R	Include explanation of the strategies	Increase understanding of strategies	Information	KJ analysis 2/Missing information in the tool/2 Kinnarps, Gemla	Must have
46,2	R	Include information of the aim and gains of the strategies	Increase understanding of strategies	Information	KJ analysis 2/Missing information in the tool/2 Kinnarps, Gemla	Should have
46,3	R	Include clear differentiation of the different strategies	Increase understanding of strategies	Information	KJ analysis 2/Missing information in the tool/2 Kinnarps, Gemla	Must have
47	G	Ensure trust for the chosen methods in the tool	Increase chances of usage	Information	KJ analysis 2/Missing information in the tool/2 Kinnarps, Ragnars	Must have
47,1	R	Explain the 10-R framework	Increase transparency and understanding of the tool	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Must have
47,2	R	Explain what the pre-named topics and alternatives mean	Increase transparency and understanding of the tool	Information	KJ analysis 2/Missing information in the tool/1 Ragnars	Should have
48	G	Enable mapping of strategies for the company	Enable comparison of strategies	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Could have
48,1	G	Enable inclusion of KPI in the mapping of strategies	Enable comparison of strategies	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Could have
48,2	G	Enable inclusion of SWOT-analysis in the mapping of strategies	Enable comparison of strategies	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Could have
49	R	Include source of information	Enable traceability and further researching of strategies	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Should have

49,1	R	Include source of why the strategy is worth it	Enable traceability and further researching of strategies	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Should have
50	G	Enable multiple navigational paths through the tool	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/2 Kinnarps, Ragnars	Must have
50,1	R	Enable choosing strategy directly from the list	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/1 Ragnars	Should have
50,2	R	Enable handling lists in multiple ways	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/1 Ragnars	Must have
50,3	R	Enable confirming automatic pop-up to close	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/1 Kinnarps	Should have
50,4	R	Enable closing pop-up with closing icon	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/2 Gemla, Ragnars	Must have
50,5	R	Enable navigation through overview cards	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/1 Kinnarps	Must have
51	R	Inform where the entered information is saved and how you reach it	Increase transparency and understanding of the tool	Information	KJ analysis 2/Good to enable different ways of navigating/1 Ragnars	Must have
52	R	Include visual elements throughout the tool	Faster understanding and correct actions when using the tool	Design	KJ analysis 2/Appreciation for visualization/3 Ragnars, Gemla, Kinnarps	Should have
52,1	R	Include visual representation of BM	Faster understanding and less cognitive load when using the tool	Design	KJ analysis 2/Appreciation for visualization/3 Ragnars, Gemla, Kinnarps	Must have
52,2	G	Differentiate clearly which BM is changeable and not	Faster understanding and less cognitive load when using the tool	Design	KJ analysis 2/Appreciation for visualization/1 Kinnarps	Must have
52,3	G	Enable complex visualisation of BM in several layers	Enable deeper handling of the process	Design	KJ analysis 2/Appreciation for visualization/2 Kinnarps, Ragnars	Won't have
52,4	R	Visualise the circular BM as a circle	Faster understanding and less cognitive load when using the tool	Design	KJ analysis 2/Appreciation for visualization/1 Ragnars	Could have
53	R	Include summary of replies of the step	Enable understanding and overview of previous actions	Information	KJ analysis 2/Appreciation for summaries/3 Kinnarps, Ragnars, Gemla	Must have
53,2	R	Include summary of replies of the step in its overview	Enable understanding and overview of previous actions	Information	KJ analysis 2/Appreciation for summaries/2 Kinnarps, Gemla	Must have
54	G	Ensure feeling of trust in the tool	Increase chances of usage	Information	KJ analysis 2/Trusts the tool/3 Kinnarps, Ragnars, Gemla	Must have
54,1	G	Ensure feeling of being thoroughly revised	Increase chances of usage	Information	KJ analysis 2/Trusts the tool/3 Kinnarps, Ragnars, Gemla	Must have
55	R	Enable comparison of strategies	Ease the decision of strategy	Function	KJ analysis 2/Trusts the tool/1 Kinnarps	Should have
56	G	Enable foundational understanding of the process	Ease the process of developing a new CBM	Information	KJ analysis 2/Trusts the tool/2 Kinnarps, Gemla	Must have
57	R	Enable automation of the results based on the replies throughout the process	Ease the process of developing a new CBM	Information	KJ analysis 2/Trusts the tool/1 Ragnars	Must have
58	R	Enable changing the visualisation of the current business model	Ensure correct data entry	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
58,1	R	Enable changing the visualisation of the current business model through multiple actions	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
58,11	R	Enable drag and drop--function to move blocks	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
58,12	R	Enable removing blocks	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
58,13	R	Enable adding blocks	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have

58,14	R	Enable copying blocks	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
58,15	R	Enable moving block through arrows	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
58,16	R	Enable complex building of BM in several layers	Enable deeper handling of the process	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/1 Ragnars	Should have
59	G	Encourage users to spend time on each task	Adhere to process needing time	Function	KJ analysis 2/Took their time/3 Kinnarps, Ragnars, Gemla	Must have
60	R	Enable working with several strategies in one process	Enable deeper handling of the process	Function	KJ analysis 2/Want to work with multiple strategies simultaneously/3 Kinnarps, Ragnars, Gemla	Won't have
61	R	Enable prioritisation of the available strategies	Ease the decision of strategy	Function	KJ analysis 2/Want to prioritize among strategies/3 Kinnarps, Ragnars, Gemla	Should have
61,1	R	Enable prioritisation of the relevant strategies	Ease the decision of strategy	Information	KJ analysis 2/Want to prioritize among strategies/2 Kinnarps, Ragnars	Should have
61,2	R	Enable visual deprioritize irrelevant strategies	Ease the decision of strategy	Function	KJ analysis 2/Want to prioritize among strategies/3 Kinnarps, Ragnars, Gemla	Should have
61,3	R	Enable visual prioritisation among strategies	Ease the decision of strategy	Function	KJ analysis 2/Want to prioritize among strategies/3 Kinnarps, Ragnars, Gemla	Should have
62	G	Offer clarity in interface	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
62,1	R	Explain the usage of the tool	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/1 Gemla	Must have
62,11	R	Explain what is presented in the interface	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
62,2	R	Offer clarity of where the user is in the interface	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/1 Gemla	Must have
62,3	G	Offer clear correlation between functions' design and their actions	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/2 , Ragnars, Gemla	Must have
62,31	G	Offer clear understanding of which are clickable elements	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/1 Kinnarps	Must have
62,31	G	Offer clear understanding of which are unclickable elements	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/1 Kinnarps	Must have
62,4	G	Adapt interface to low digital maturity	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/2 , Ragnars, Gemla	Must have
62,5	G	Offer consistency within the interface	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
62,51	G	Offer consistency within layouts	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
62,52	G	Offer consistency with automatic actions within the interface	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
62,53	G	Offer consistency in descriptions	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
63	G	Offer clarity in the understanding of the tasks within the process	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
63,1	R	Offer introduction of the tool and its tasks	Ease use for real-world application	Function	KJ analysis 2/Need for greater interface clarity/2 Kinnarps, Ragnars	Should have
63,2	R	Offer clarity of what the results are based on	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/2 Kinnarps, Gemla	Must have
63,3	R	Offer understanding of how to execute the tasks	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/1, Gemla	Must have
63,4	R	Offer understanding of what type of answers are expected	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/2 Kinnarps, Gemla	Must have

63,5	R	Offer deeper understanding of what the questions means	Ease use for real-world application	Information	<i>KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla</i>	Must have
------	---	--	-------------------------------------	-------------	--	-----------

I

Refined Prototype

This appendix includes the changed frames from the refined high-fidelity prototype. The frames are the result from the iterated refinement of the prototype following the usability tests in the Usability phase. Those which did not change in this phase are therefore similar to the ones presented in Appendix F. The frames are presented with descriptive figure texts. They are the result as an initial base to continue the development of the prototype, and clearer views of the tool in its final form are presented in Appendix J.



Figure I.1: Home page during the first and third step, showcasing the development of the progress bar



Figure I.2: Information pop-up presented when reaching the first task in the first step, and the first task including the carousel format with more prominent navigation

I. Refined Prototype

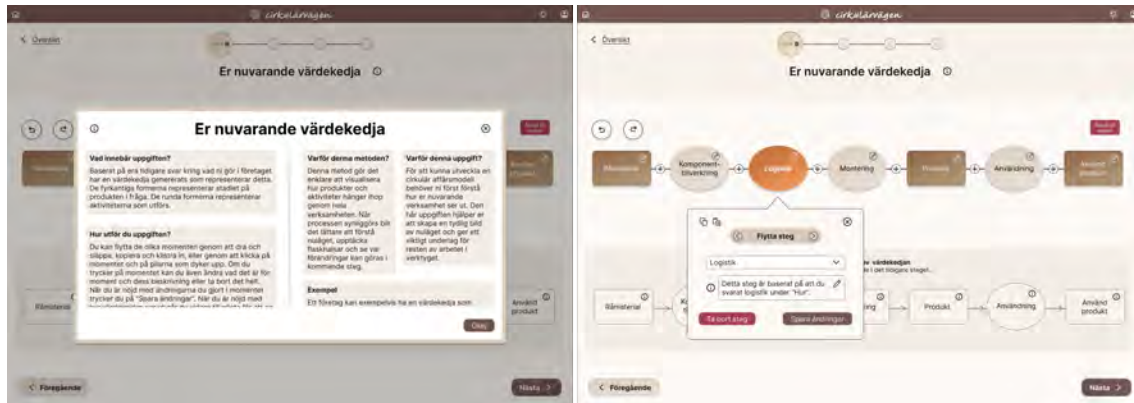


Figure I.3: Information pop-up presented when reaching the second task in the first step, and the second task including the updated value chain maneuver with more prominent visual feedback

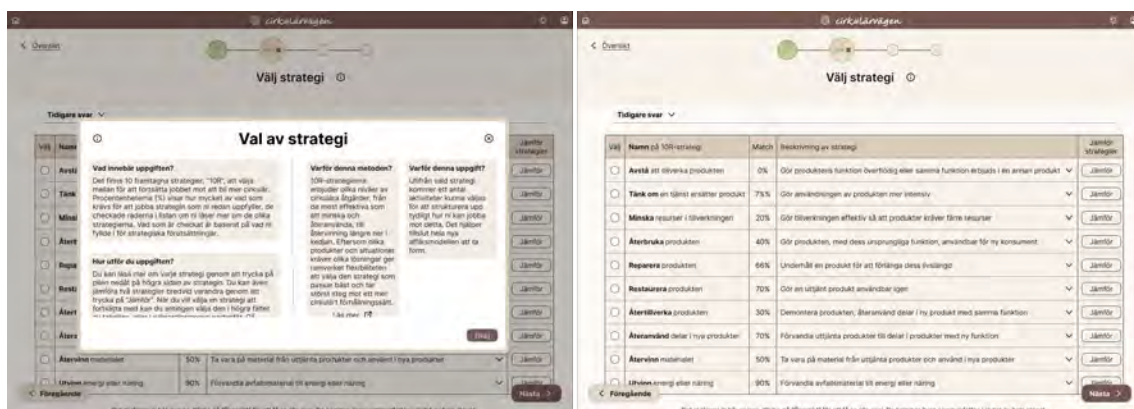


Figure I.4: Information pop-up presented previous the second task in the second step, and the second task including the updated list when choosing with choice possibility directly in the list



Figure I.5: Summary in the second step showing updated list with regulations and checkmarks, mirroring the same list in the previous frames extended form

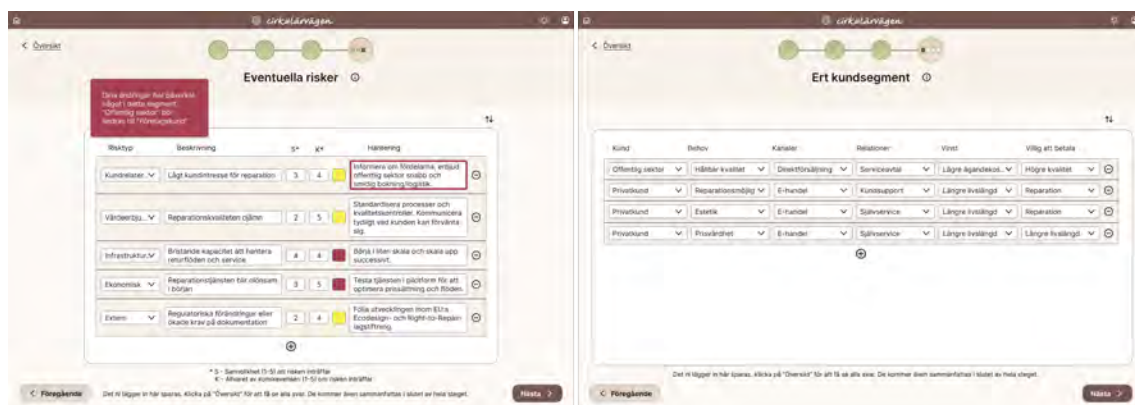


Figure I.6: Updated frame when changes have been made from the CBMC in the fourth step, where those changes affect the entries, as well as updated list with only drop-downs when entering customer segment

L







Figure I.8: Changed text fields in the final summary when finalized the process

J

Final Prototype

This appendix includes all frames from the final high-fidelity prototype created in Figma. The frames are the result from the iterated refinement of the prototype following the expert tests in the Expert phase. The frames are presented with descriptive figure texts.



Figure J.1: Home page in slightly extended form



Figure J.2: Tutorial available from home page

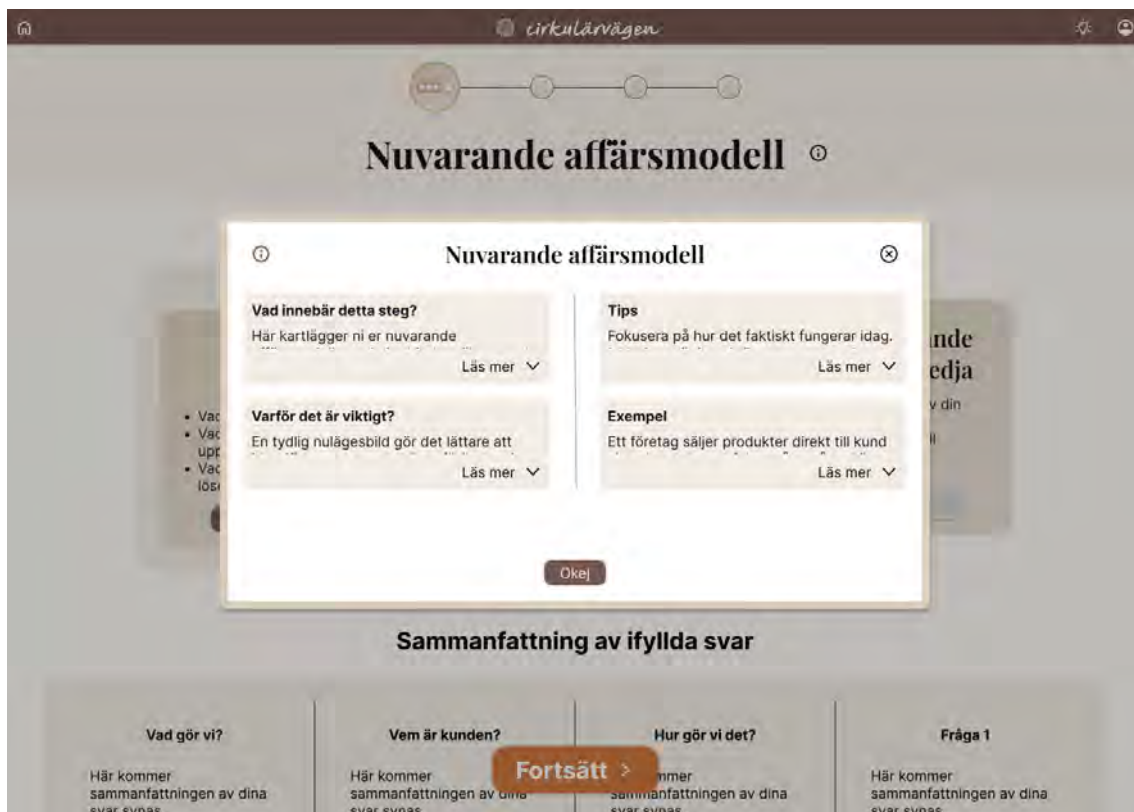


Figure J.3: Informational pop-up on first overview - consistent throughout the tool



Figure J.4: Overview of the first step



Figure J.5: Overview of the first step, when completed the first task

Figure J.6: First task in the first step: analysing the current business model



Figure J.7: Loading screen generating the value chain in the second task of first step



Figure J.8: Second task in the first step: reviewing the generated value chain



Figure J.9: Moving blocks in the value chain in the second task in the first step



Figure J.10: Adding blocks in the value chain in the second task in the first step



Figure J.11: Summary of the first step in the final prototype



Figure J.12: Overview of the second step



Figure J.13: First task in the second step: filling out strategic preconditions

Välj strategi

Tidigare svar ▾

Välj	Namn på 10R-strategi	Match	Beskrivning av strategi	Jämför strategier
☐	Avstå att tillverka produkten	0%	Gör produktens funktion överflödig eller samma funktion erbjuds i en annan produkt	Jämför
☐	Tänk om en tjänst ersätter produkt	7%	Gör användningen av produkten mer intensiv	Jämför
☐	Minska resurser i tillverkningen	20%	Gör tillverkningen effektiv så att produkter kräver färre resurser	Jämför
☐	Återbruka produkten	40%	Gör produkten, med dess ursprungliga funktion, användbar för ny konsument	Jämför
☐	Reparera produkten	66%	Underhåll en produkt för att förlänga dess livslängd	Jämför
☐	Restaurera produkten	70%	Gör en uttjänt produkt användbar igen	Jämför
☐	Återtillverka produkten	30%	Demontera produkten, återanvänd delar i ny produkt med samma funktion	Jämför
☐	Återanvänd delar i nya produkter	70%	Förvandla uttjänta produkter till delar i produkter med ny funktion	Jämför
☐	Återvinn materialet	50%	Ta vara på material från uttjänta produkter och använd i nya produkter	Jämför
☐	Utvinn energi eller näring	90%	Förvandla avfallsmaterial till energi eller näring	Jämför

< Föregående Sammanfattning >

Det ni lägger in här sparas. Klicka på "Översikt" för att få se alla svar. De kommer även sammanfattas i slutet av hela steget.

Figure J.14: Second task in the second step: choosing a circular strategy

Välj strategi

Tidigare svar ▾

Välj	Namn på 10R-strategi	Match	Beskrivning av strategi	Jämför strategier
☐	Avstå att tillverka produkten	0%	Gör produktens funktion överflödig eller samma funktion erbjuds i en annan produkt	Jämför
☐	Tänk om en tjänst ersätter produkt	7%	Gör användningen av produkten mer intensiv	Jämför
☐	Minska resurser i tillverkningen	20%	Gör tillverkningen effektiv så att produkter kräver färre resurser	Jämför
☐	Återbruka produkten	40%	Gör produkten, med dess ursprungliga funktion, användbar för ny konsument	Jämför
☐	Reparera produkten	66%	Underhåll en produkt för att förlänga dess livslängd	Jämför

Innebär

Åtgärda skador, slitage eller funktionsfel istället för att ersätta dem. Det handlar både om att designa produkter som går att reparera och att möjliggöra för kunder eller partners att faktiskt utföra reparationer.

Kräver

- ✓ Reservdelar i lager
- Reklamationer
- ✓ Material enkla att byta ut
- ✓ Kompetens inom reparation
- Auktoriserade reparationspartners / verkstäder
- Leverantörer

Regelverk

- Svanen
- Möbelfakta
- EcoLabel
- ISO 7173:2023
- ISO 7170:2005
- ISO 8191

Exempel

Swedese arbetar med reparation som en del av sitt erbjudande. De erbjuder reparation och restaurering av möbler, även av andra varumärken. Deras tjänster sträcker sig från enklare lagningar till full renovering.

Genom att reparation i affären hjälper de kunder att behålla och

< Föregående Sammanfattning >

Figure J.15: The strategy list in its extended form

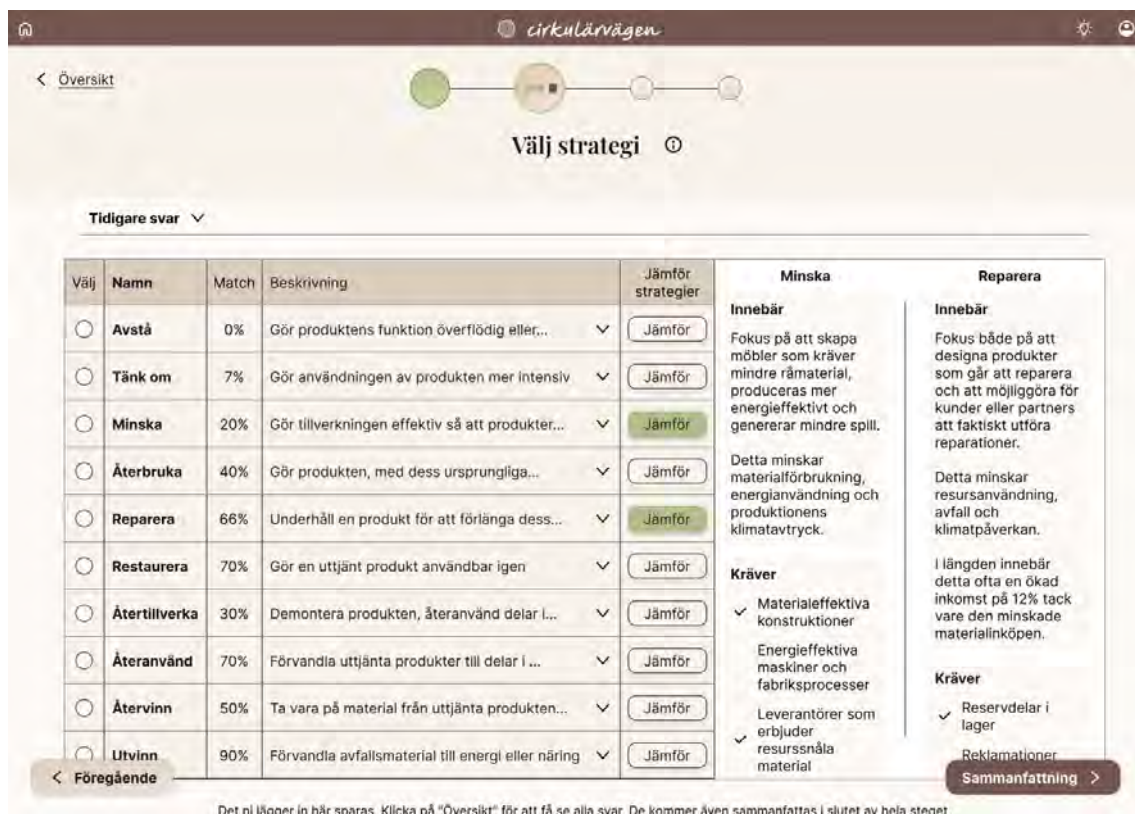


Figure J.16: The strategy list when comparing two strategies next to each other



Figure J.17: Summary of the second step

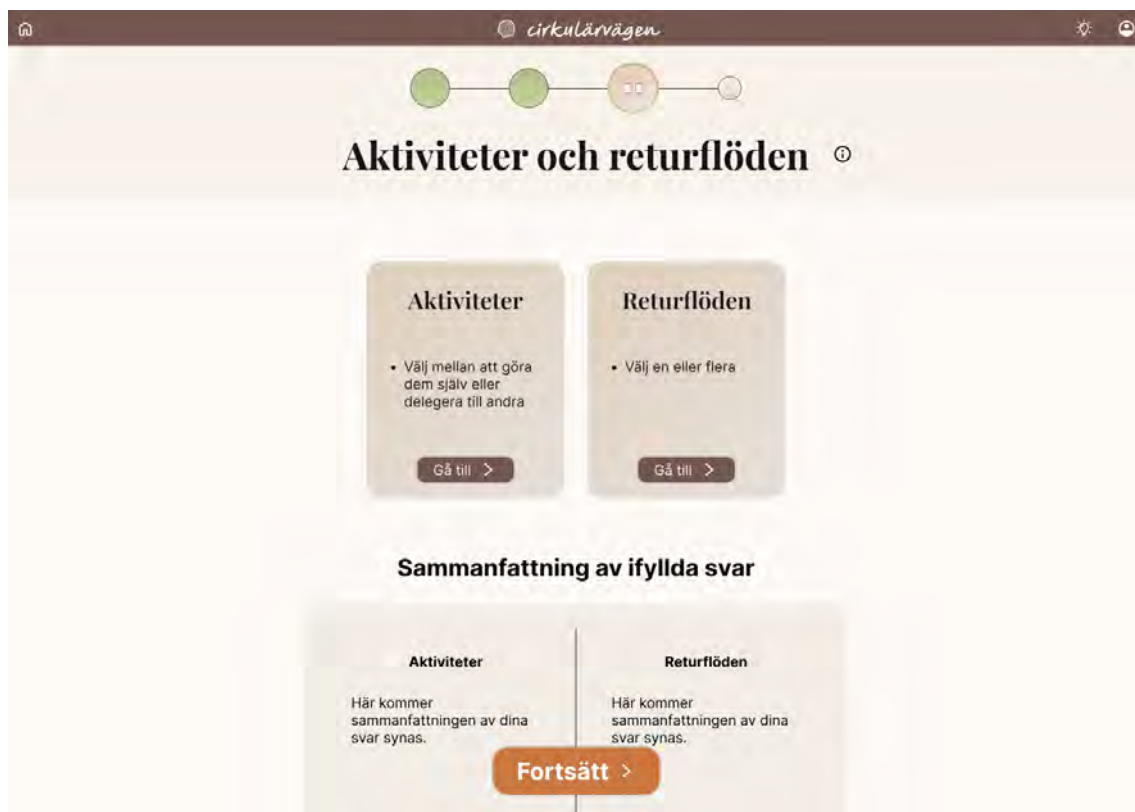


Figure J.18: Overview of the third step

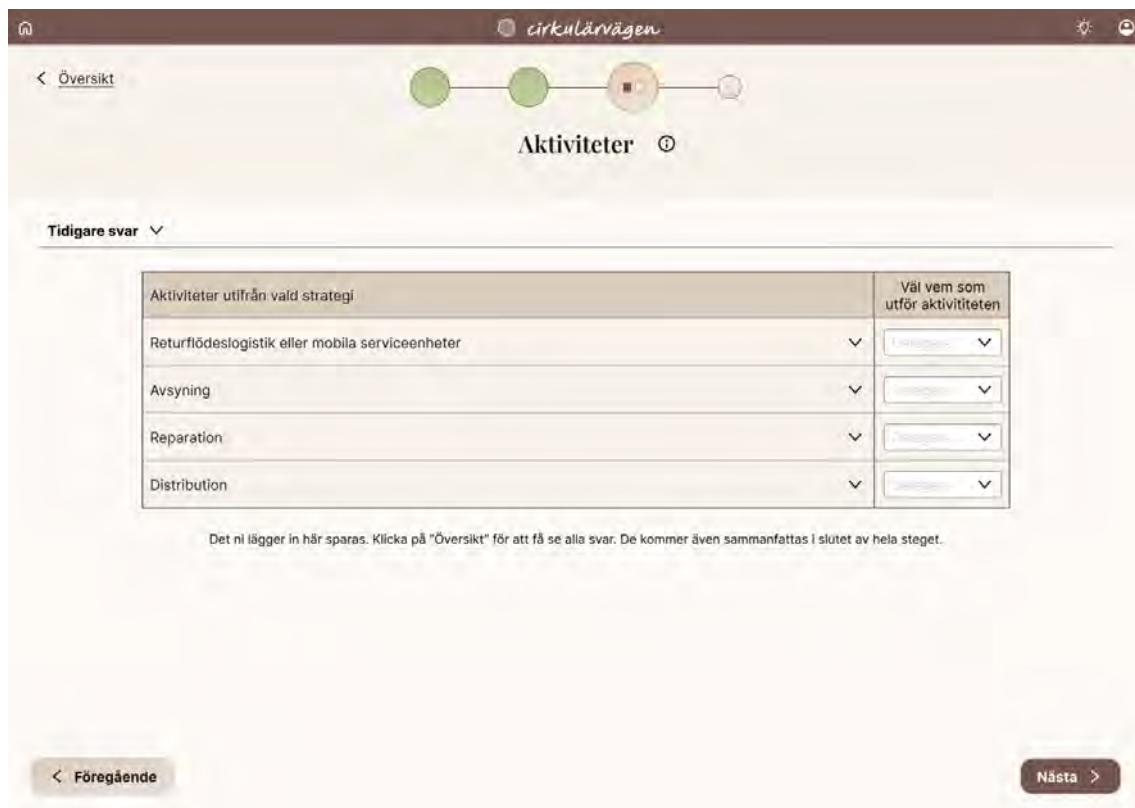
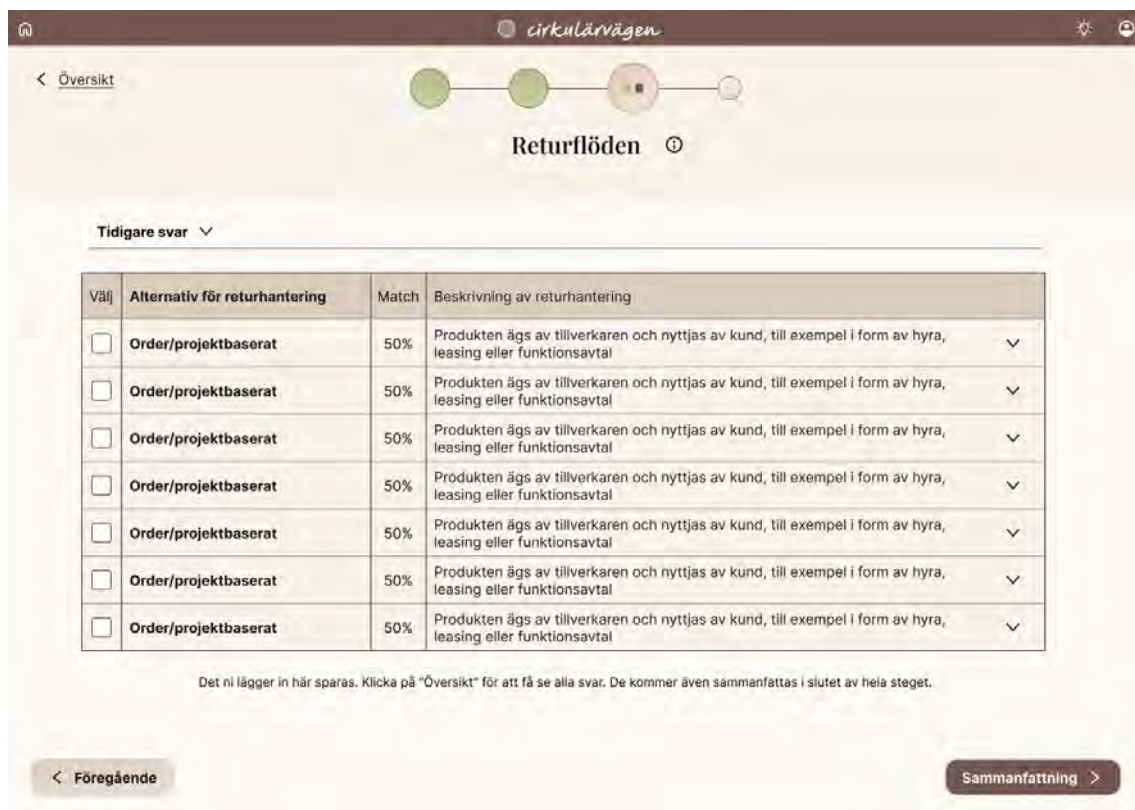


Figure J.19: The first task of the third step, where they delegate circular activities



Returflöden

Tidigare svar ▾

Välj	Alternativ för returhantering	Match	Beskrivning av returhantering
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionsavtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionsavtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionsavtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionsavtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionsavtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionsavtal
☐	Order/projektbaserat	50%	Produkten ägs av tillverkaren och nyttjas av kund, till exempel i form av hyra, leasing eller funktionsavtal

Det ni lägger in här sparas. Klicka på "Översikt" för att få se alla svar. De kommer även sammanfattas i slutet av hela steget.

< Föregående Sammanfattning >

Figure J.20: Second task in the third step: choosing return flows

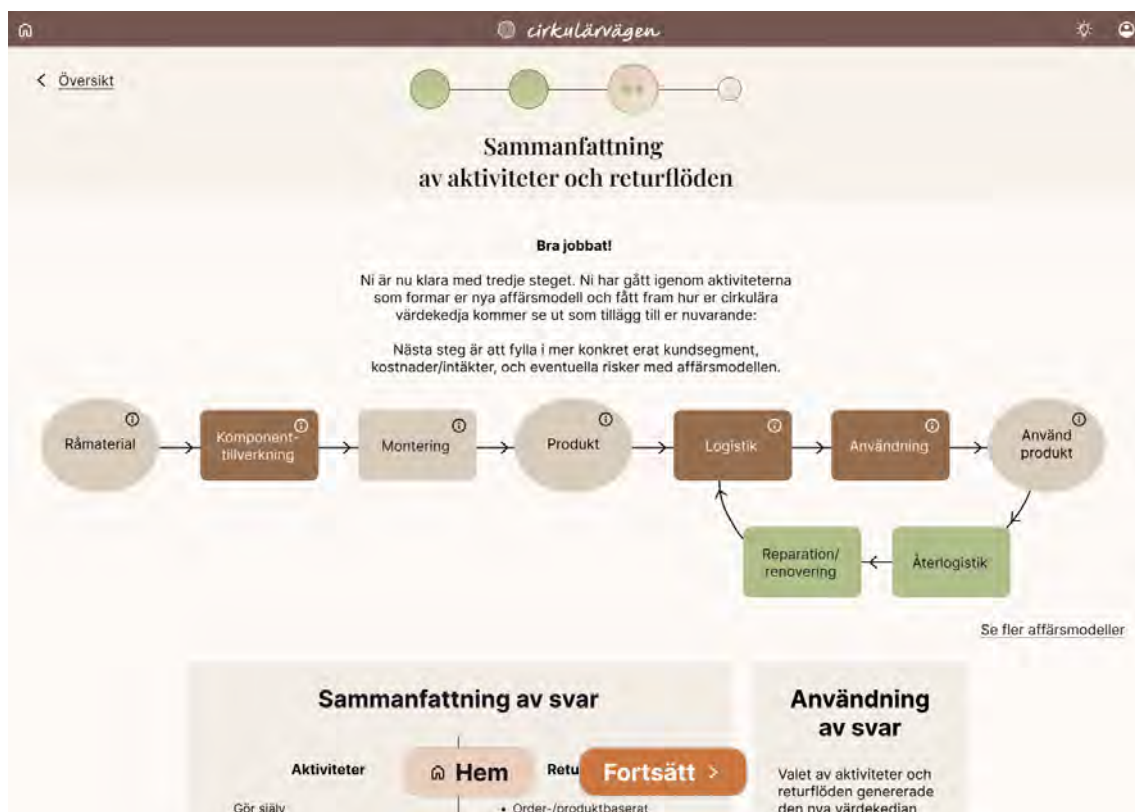


Figure J.21: Summary of the third step



Figure J.22: Overview of the fourth step

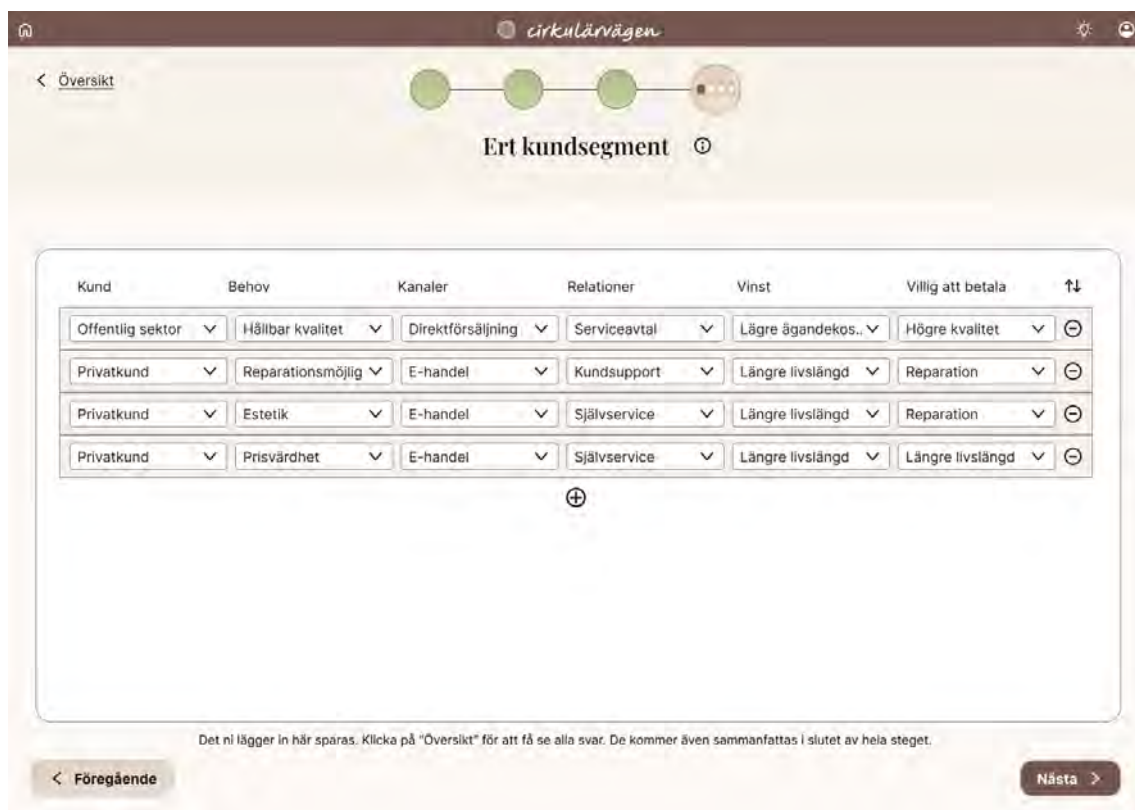


Figure J.23: First task in the fourth step: defining the customer segment

Resultaträkning

Kostnader

Arbetskraft: Personal för upphäm... 20 000, Lön till snickare och... 45 000

Service: [input] [Summa]

Material och komponenter: [input] [Summa]

Transport: [input] [Summa]

Tillverkning (inklusive energi): [input] [Summa]

Administration: [input] [Summa]

1/2

Summa av kostnader: 145 000, Summa av intäkter: 255 500, Resultatsumma: +110 500

< Föregående, Nästa >

Det ni lägger in här sparas. Klicka på "Översikt" för att få se alla svar. De kommer även sammanfattas i slutet av hela steget.

Figure J.24: Second task in the fourth step: defining costs and revenues

Eventuella risker

Risktyp	Beskrivning	S*	K*	Hantering
Kundrelater...	Lågt kundintresse för reparation	3	4	Informera om fördelarna, erbjud offentlig sektor snabb och smidig bokning/logistik.
Värdeerbju...	Reparationskvaliteten ojämn	2	5	Standardisera processer och kvalitetskontroller. Kommunicera tydligt vad kunden kan förvänta sig.
Infrastruktur...	Bristande kapacitet att hantera returflöden och service	4	4	Börja i liten skala och skala upp successivt.
Ekonomisk	Reparationstjänsten blir olönsam i början	3	5	Testa tjänsten i pilotform för att optimera prissättning och flöden.
Extern	Regulatoriska förändringar eller ökade krav på dokumentation	2	4	Följa utvecklingen inom EU:s Ecodesign- och Right-to-Repair-lagstiftning.

* S - Sannolikhet (1-5) att risken inträffar
K - Allvaret av konsekvensen (1-5) om risken inträffar

< Föregående, Sammanfattning >

Det ni lägger in här sparas. Klicka på "Översikt" för att få se alla svar. De kommer även sammanfattas i slutet av hela steget.

Figure J.25: Third task in the fourth step: identifying risks

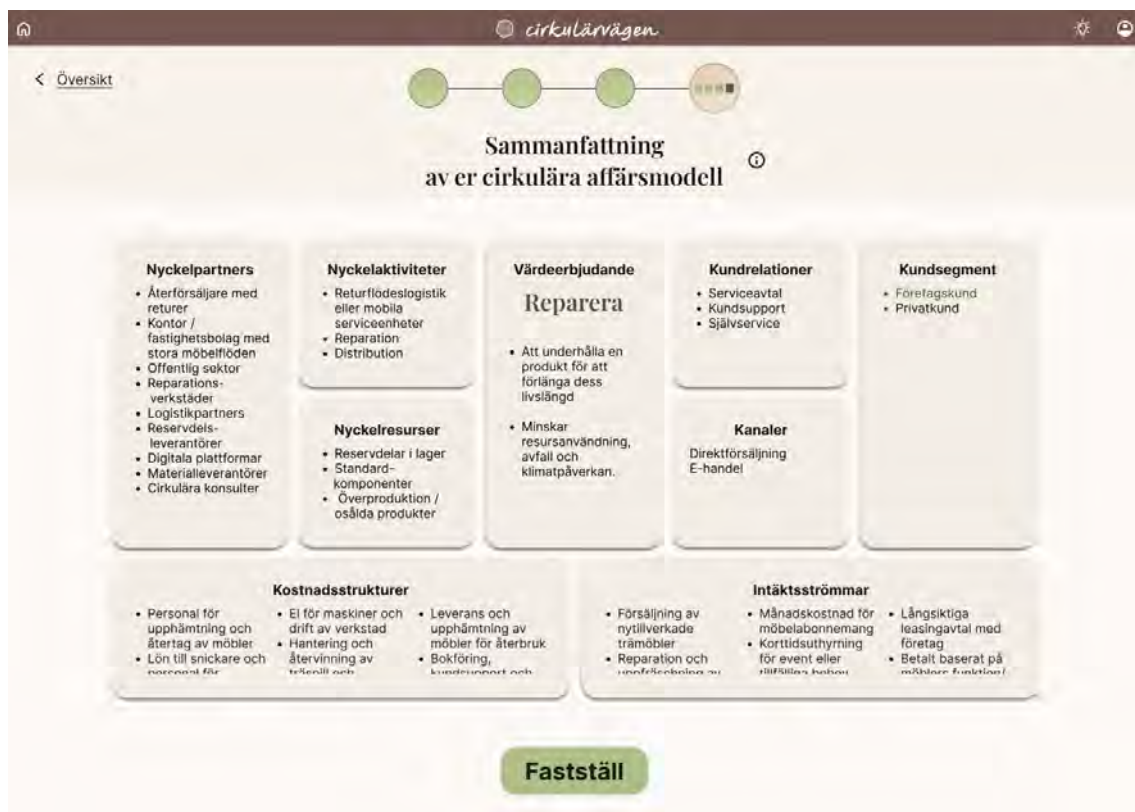


Figure J.26: Fourth task in the fourth step: reviewing the CBMC

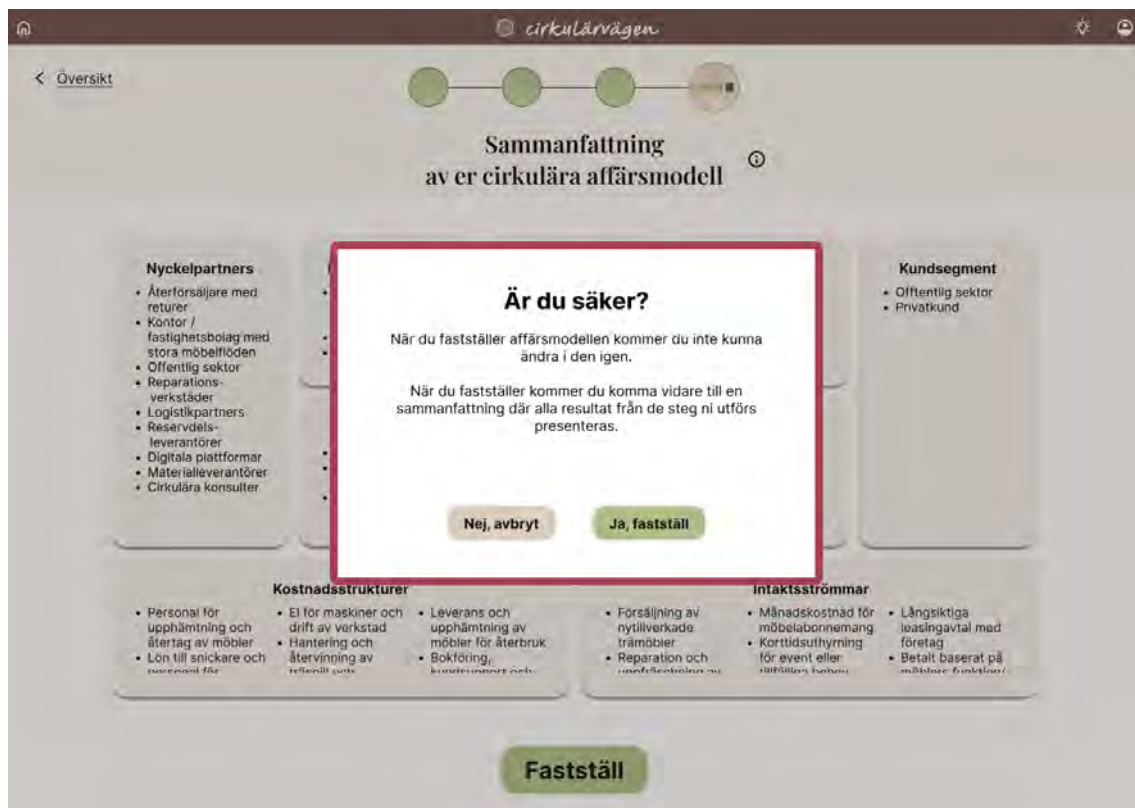


Figure J.27: Dialogue box when finalizing the circular business model

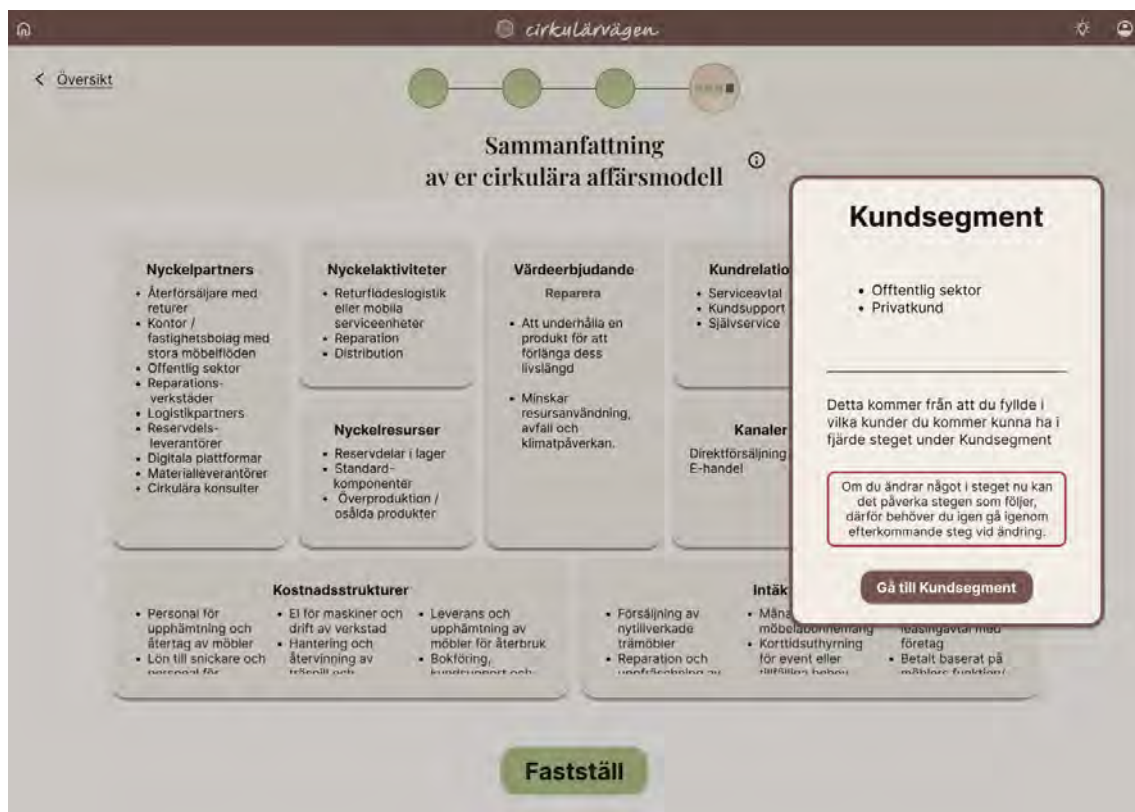


Figure J.28: Dialogue box when wanting to change an entry in a segment

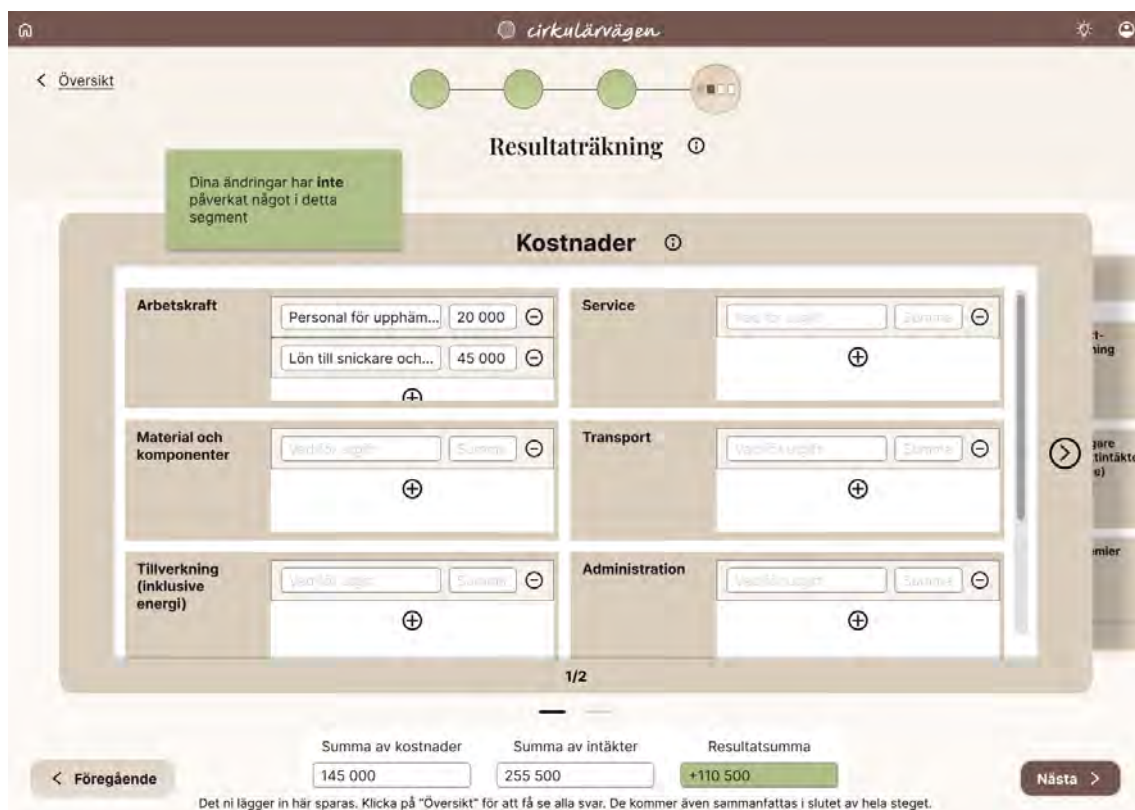


Figure J.29: Feedback when data does not need updating after changes

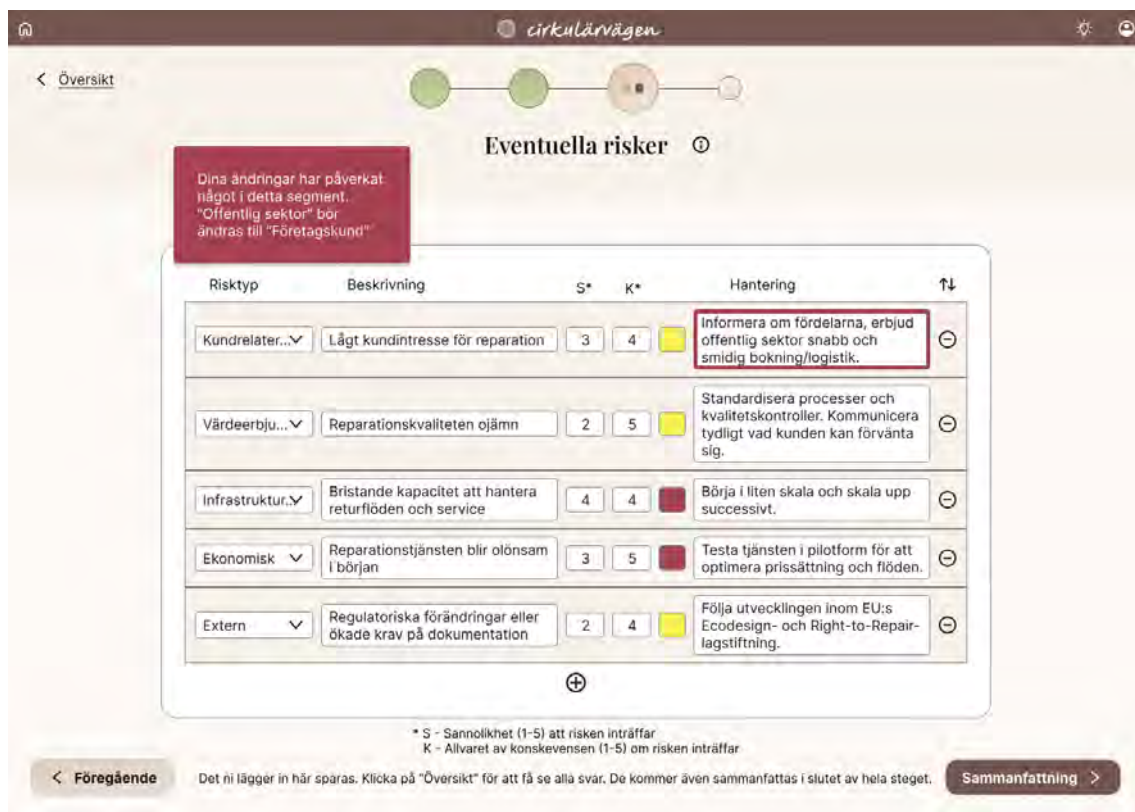


Figure J.30: Feedback when data needs updating after changes



Figure J.31: Home page when done with the process



Figure J.32: Final summary in the final prototype

K

Complete List of Requirements and Guidelines

This appendix includes the complete list of requirements and guidelines formed in the all phases. They were compiled from the list emerged after the interviews and literature study together with the list which emerged from the usability test. They were prioritized using MoSCoW, with 'Must haves', 'Should haves', 'Could haves', and 'Won't haves'. They were also divided into the categories: information, design, functions, and smaller functions. They are presented in numerical order where the sources are fully visible for traceability.

ID	R / G	Description	Cause/effect	Category	Source	Prioritization
1	R	Be a digital tool	Enable digital use	Design	<i>CirkuTrä/ReFurn Scope & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Must have
1,1	R	Include industry 4.0 infrastructure	Enable practical use	Design	<i>Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin</i>	Won't have
1,2	G	High usability	Ease use for real-world application	Design	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Must have
1,4	R	Enable asynchronous use	Ease use for real-world application in real-time	Smaller function	<i>Lit. study/Software tools for business model innovation: current state and future challenges</i>	Could have
1,5	R	Enable role-specific UX/UI for internal stakeholders	Tailor experience for designers, manufacturers, suppliers	Smaller function	<i>Lit. study/TMF, 2020</i>	Won't have
2	R	Base development process on four steps framework from CirkuTrä	Enable applicable results	Function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,1	R	Initiate the development process with analysis of current business model	Enable understanding of current work and ensure possibility of implementation in reality	Function	<i>CirkuTrä/ReFurn Scope & Scope & KJ-analysis/To change business model is a complex process - there are always improvements possible/ All exc Ragnars & Lit. study/Kans & Löfving (2023), CirkuTrä PP</i>	Must have
2,11	R	Enable analysis of current business model's actions through focus on the "what"s	Enable concrete understanding of what they are doing	Function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,111	R	Enable analysis of current business model's actions through what it is that they are doing	Enable concrete understanding of what they are doing	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,112	R	Enable analysis of current business model's actions through what needs they are fulfilling	Enable concrete understanding of what needs their work is fulfilling	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,113	R	Enable analysis of current business model's actions through what problems they are solving	Enable concrete understanding of what problems their work are solving today	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,12	R	Enable analysis of current business model's action through focus on the "how"s	Enable concrete understanding of how they are doing their work	Function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,121	R	Enable analysis of current business model's action through how they are fulfilling the target groups needs	Enable concrete understanding of how they are doing their work	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,122	R	Enable analysis of current business model's action through howthey are solving the target group's problems	Enable concrete understanding of how they are doing their work	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,123	R	Enable analysis of current business model's action through what the most important activities are	Enable concrete understanding of how they are doing their work	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,124	R	Enable analysis of current business model's action through which competencies and resources are important	Enable concrete understanding of how they are doing their work	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,13	R	Enable analysis of current business model's action through focus on the "who"s	Enable concrete understanding of their current customers and stakeholder	Function	<i>CirkuTrä/ReFurn Scope</i>	Must have

2,131	R	Enable analysis of current business model's action through who their customer or target group is	Enable concrete understanding of their current customers and stakeholder	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,132	R	Enable analysis of current business model's action through what needs and problems does the target group have	Enable concrete understanding of their current customers and stakeholder	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,133	R	Enable analysis of current business model's action through How they reach the target group	Enable concrete understanding of their current customers and stakeholder	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,134	R	Enable analysis of current business model's action through what collaborations they need in there business	Enable concrete understanding of their current customers and stakeholder	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,2	R	Facilitate identifying of future circular strategy as a second step of the development process	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,21	R	Enable identifying of the company's available resources and waste	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,211	R	Enable identifying the company's available resources and scraps through if there are resources possible for better usage	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,212	R	Enable identifying of the company's available resources and scraps through if there are scraps to be used instead of discarded	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,22	R	Enable identifying of the company's customers and partners for the circular business model	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,221	R	Enable identifying of the company's customers through what circular needs and problems their customers have	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,222	R	Enable identifying of the company's partners through which partners/stakeholders have circular needs or problems that the company can solve	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,223	R	Enable identifying of the company's customers and partners through which partners/stakeholders can help the company solve the customers circular needs and problems	Enable concrete understanding of possible circular strategies	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,23	R	Enable identifying the company's circular goals	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,24	R	Present alternatives of circular strategies	Enable concrete understanding of possible circular strategies	Function	CirkuTrä/ReFurn Scope	Must have
2,241	R	Visualise circular strategies (10R/3R framework)	Enable concrete understanding of possible circular strategies	Smaller function	Lit. study/Circularise 10R blog, KansLöfving2023, En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling	Must have
2,3	R	Facilitate choice of circular business model as a third step of the development process	Enable concrete understanding of possible circular models	Function	CirkuTrä/ReFurn Scope	Must have
2,31	R	Enable identifying different circular activities based on circular strategies	Enable concrete understanding of possible circular models	Function	CirkuTrä/ReFurn Scope	Must have

2,32	R	Enable decision of distribution of activities to internal or external	Enable concrete understanding of possible circular models	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,33	R	Present alternatives of handling return flows	Enable concrete understanding of possible circular models	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,34	R	Present alternatives of circular business models based on circular strategies	Enable concrete understanding of possible circular models	Function	CirkuTrä/ReFurn Scope	Must have
2,4	R	Enable concretisation of the company's new circular business model	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have
2,41	R	Enable concretisation of the company's customers or target groups	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have
2,411	R	Enable concretisation of the company's customers or target groups through who has similar needs	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,42	R	Enable concretisation of the company's cost and revenues	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Must have
2,421	R	Enable concretisation of the company's cost through their manpower, material and components, manufacturing, waste management, service, transportation, administration and investments	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,422	R	Enable concretisation of the company's revenues by through their product sales, other product revenue, prive premiums, pay per use, premuneration and leasing	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,423	R	Enable concretisation of the company's revenues through their contracts	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Must have
2,43	R	Enable concretisation of their new business model through focus on the "what"s	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Won't have
2,431	R	Enable concretisation of their new business model through what it is that they are doing	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Won't have
2,432	R	Enable analysis of their newbusiness model through what needs they are fulfilling	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Won't have
2,433	R	Enable concretisation of their new business model through what problems they are solving	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Won't have
2,44	R	Enable concretisation of their new business model through focus on the "how"s	Enable concrete understanding of the decided circular business model	Function	CirkuTrä/ReFurn Scope	Won't have
2,441	R	Enable concretisation of their new business model through how they are fulfilling the target groups needs	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Won't have
2,442	R	Enable concretisation of their new business model through howthey are solving the target group's problems	Enable concrete understanding of the decided circular business model	Smaller function	CirkuTrä/ReFurn Scope	Won't have

2,443	R	Enable concretisation of their new business model through what the most important activities are	Enable concrete understanding of the decided circular business model	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Won't have
2,444	R	Enable concretisation of their new business model through which competencies and resources are important	Enable concrete understanding of the decided circular business model	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Won't have
2,45	R	Enable concretisation of their new business model through focus on the "who"s	Enable concrete understanding of the decided circular business model	Function	<i>CirkuTrä/ReFurn Scope</i>	Won't have
2,451	R	Enable concretisation of their new business model through who their customer or target group is	Enable concrete understanding of the decided circular business model	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Won't have
2,452	R	Enable concretisation of their new business model through what circular needs and problems does the target group have	Enable concrete understanding of the decided circular business model	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Won't have
2,453	R	Enable concretisation of their new business model through how they reach the target group	Enable concrete understanding of the decided circular business model	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Won't have
2,454	R	Enable concretisation of their new business model through what collaborations they need in there business	Enable concrete understanding of the decided circular business model	Smaller function	<i>CirkuTrä/ReFurn Scope</i>	Won't have
2,46	R	Enable collective concretisation of their new business model through a circular business model canvas	Enable concrete understanding of the decided circular business model	Function	<i>CirkuTrä/ReFurn Scope</i>	Must have
2,461	R	Include Add / Remove / Change operations (mutations) in the use of business model canvas	Enable practical transition steps	Smaller function	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Could have
3	G	Ensure feeling of trust	Increase trust in the tool and its outcomes	Information	<i>KJ-analysis/They want a digital tool/2 Cluster & Kinnarps</i>	Must have
3,1	G	Show respect to the reality of the business	Increase trust in the tool and its outcomes	Information	<i>KJ-analysis/They want a digital tool/1 Cluster</i>	Must have
3,2	R	Include transparant and clear explanations	Increase trust in the tool and its outcomes	Information	<i>KJ-analysis/They want a digital tool/1 Cluster</i>	Must have
3,3	G	Ensure feeling of trust for the new business model within the business	Minimse worry within the company for the upcoming changes	Information	<i>KJ analysis/The business feels a worry for new business models/4 Materia, Cluster, Ragnars, Kinnarps</i>	Must have
3,31	G	Increase trust in the information regarding different strategies	Minimse worry within the company for the upcoming changes	Information	<i>KJ analysis 2/Missing information in the tool/2 Kinnarps, Gemla</i>	Must have
3,311	R	Include explanation of the strategies	Increase understanding of strategies	Information	<i>KJ analysis 2/Missing information in the tool/2 Kinnarps, Gemla</i>	Must have
3,312	R	Include information of the aim and gains of the strategies	Increase understanding of strategies	Information	<i>KJ analysis 2/Missing information in the tool/2 Kinnarps, Gemla</i>	Should have
3,4	G	Ensure feeling of trust in the tool	Increase chansen of usage	Information	<i>KJ analysis 2/Trusts the tool/3 Kinnarps, Ragnars, Gemla</i>	Must have
3,41	G	Ensure trust for the chosen methods in the tool	Increase chansen of usage	Information	<i>KJ analysis 2/Missing information in the tool/2 Kinnarps, Ragnars</i>	Must have
3,411	R	Explain the 10-R framework	Increase transparency and understanding of the tool	Information	<i>KJ analysis 2/Missing information in the tool/1 Kinnarps</i>	Must have
3,412	R	Explain what the pre-named topics and alternatives mean	Increase transparency and understanding of the tool	Information	<i>KJ analysis 2/Missing information in the tool/1 Ragnars</i>	Should have
3,42	G	Ensure feeling of being thoroughly revised	Increase chansen of usage	Information	<i>KJ analysis 2/Trusts the tool/3 Kinnarps, Ragnars, Gemla</i>	Must have
4,1	G	Motivate why circularity is necessary	Increase understanding of why it is important that they do the work	Information	<i>KJ analysis/Positive attitude to circularity/2 Materia, Gemla</i>	Should have
4,2	G	Motivate the use of this tool	Increase understanding of why they should use the tool	Information	<i>KJ analysis/They want a digital tool/2 Cluster, Kinnarps</i>	Must have

5	G	Enable understanding of the practical work of the new business model	Increase understanding of how they will work	Information	<i>KJ-analysis/They have difficulties handling the practical parts after transitioning/6 All</i>	Must have
5,1	R	Enable structuring of logistics depending on chosen strategy	Facilitate planning of practical logistics	Smaller function	<i>KJ-analysis/They have difficulties handling the logistics/3 & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact. & Lit. Study/ "Circular economy: Factors affecting the financial performance of product take-back systems"</i>	Should have
5,2	R	Enable structuring of manpower depending chosen strategy	Help planning of needed manpower	Smaller function	<i>KJ-analysis/They have difficulties understanding the manpower needed/3 & Lit. Study/ "Circular economy: Factors affecting the financial performance of product take-back systems"</i>	Should have
5,3	G	Include support for remanufacturing workflows	Facilitate planning of practical logistics	Information	<i>Lit. study/Kans & Löfving (2023), Mirka2023 & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Must have
5,4	R	Inform of what the strategy would mean in practice	Increase understanding of how they will work	Information	<i>KJ analysis 2/Missing information in the tool/1 Gemla</i>	Must have
5,41	R	Inform of what services they need to offer with each strategy	Increase understanding of how they will work	Information	<i>KJ analysis 2/Missing information in the tool/1 Gemla</i>	Must have
5,42	R	Inform about logistics needed	Increase understanding of how they will work	Information	<i>KJ-analysis/They have difficulties handling the logistics/3 & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact. & KJ analysis 2/Missing information in the tool/1 Gemla</i>	Must have
5,43	R	Inform of needed manpower	Increase understanding of needed manpower	Information	<i>KJ-analysis/They have difficulties understanding the manpower needed & missing working competencies in Competence is a limited factor/3</i>	Must have
6	R	Offer guidance in the process of developing a new CBM	Ease the process of developing a new CBM	Function	<i>KJ-analysis/To change business model is a complex process - Guidance helps work of change/ 2 Balzar and Kinnarps & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin</i>	Must have
6,1	R	Include consultant within the guidance of the process	Reassure the users through the process of developing a new CBM	Function	<i>KJ-analysis/To change business model is a complex process - Guidance helps work of change/ 2 Balzar and Kinnarps</i>	Could have
6,11	R	Include AI consultant	Reassure the users through the process of developing a new CBM	Function	<i>KJ-analysis/To change business model is a complex process - Guidance helps work of change/ 2 Ragnars & Kinnarps & Lit. study/They want a digital tool/1 Balzar</i>	Could have
6,12	R	Include human consultant	Reassure the users through the process of developing a new CBM	Function	<i>KJ-analysis/To change business model is a complex process - Guidance helps work of change/ 3 Ragnars, Kinnarps & Materia</i>	Won't have

6,2	R	Enable framework-following support	Reassure the users through the process of developing a new CBM	Information	<i>Citku Trä/RE:Furn scope & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Software tools for business model innovation: current state and future challenges</i>	Must have
7	R	Include information about regulations	Simplifies understanding of needed regulations	Information	<i>KJ analysis 2/Missing information in the tool/1 Kinnarps</i>	Should have
7,1	R	Include connections to regulations relevant for the chosen strategy	Simplifies work with regulations	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity/ 2 Balzar and Kinnarps & "KJ-analysis/They want a digital tool & Lit. study/Svenskt Trä, Trämöbler & Lit. Study/ "Circular economy: Factors affecting the financial performance of product take-back systems"</i>	Should have
7,11	R	Inform about relevant regulations regarding upcoming DPP	Simplify the future transition of starting to use the upcoming systems for DPP	Information	<i>/1 Kinnarp" & Lit. study/En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity/ 2 Balzar and Kinnarps & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Should have
7,12	R	Inform about relevant certificates (ISO, Möbelfakta , (Svanen, EU, Ecolabel), etc)	Help the understanding of the work of certificates	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity/ 2 Balzar and Kinnarps & Lit. study/Svenskt Trä, Trämöbler</i>	Should have
7,13	R	Inform about EPD	Help the understanding of the work of EPDs	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity/ 2 Balzar and Kinnarps</i>	Could have
7,14	R	Inform about what is needed to fulfill the relevant regulations	Help the understanding of the work with regulations	Information	<i>KJ-analysis/To change business model is a complex process - Regulations and certificate help towards circularity - regulations demands a lot of work/ 2 Balzar and Kinnarps & Lit. study/Svenskt Trä, Trämöbler</i>	Won't have
7,141	R	Provide the companies with the relevant regulations' systems	Simplify the work of regulations	Information	<i>KJ analysis/Businesses use different systems-They retrieve regulations through respective regulator system/</i>	Won't have
7,2	R	Include information about regulations when choosing between strategies	Simplifies understanding of needed regulations	Information	<i>KJ analysis 2/Missing information in the tool/1 Kinnarps</i>	Should have
7,3	R	Include information about regulations when in the summary	Simplifies understanding of needed regulations	Information	<i>KJ analysis 2/Missing information in the tool/1 Kinnarps</i>	Should have
7,4	R	Enclose information about regulations in its own space in the interface	Simplifies readability of needed regulations	Design	<i>KJ analysis 2/Appreciation for visualization/1 Ragnars</i>	Should have

8	R	Enable following the product's full life cycle	Enables learning from product's use and contributing to its longer life	Function	<i>KJ-analysis/To change business model is a complex process - They want to be included in the entire life cycle/ 2 Balzar and Kinnarps & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Svenskt Trä, Snickerihandbok</i>	Could have
9	R	Include visual elements throughout the tool	Faster understanding and correct actions when using the tool	Design	<i>KJ analysis 2/Appreciation for visualization/3 Ragnars, Gemla, Kinnarps</i>	Should have
9,1	R	Include visual change feedback	Faster understanding and correct actions when using the tool	Smaller function	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Must have
9,11	R	Include visual change feedback in business model canvas (add/change/remove)	Faster understanding and correct actions when using the tool	Smaller function	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Should have
9,2	R	Include visual representation of BM	Faster understanding and less cognitive load when using the tool	Design	<i>KJ analysis 2/Appreciation for visualization/3 Ragnars, Gemla, Kinnarps</i>	Must have
9,21	G	Differentiate clearly which BM is changeable and not	Faster understanding and less cognitive load when using the tool	Design	<i>KJ analysis 2/Appreciation for visualization/1 Kinnarps</i>	Must have
9,22	G	Enable complex visualisation of BM in several layers	Enable deeper handling of the process	Design	<i>KJ analysis 2/Appreciation for visualization/2 Kinnarps, Ragnars</i>	Won't have
9,23	R	Visualise the circular BM as a circle	Faster understanding and less cognitive load when using the tool	Design	<i>KJ analysis 2/Appreciation for visualization/1 Ragnars</i>	Could have
10	G	Adaptable to DPP's system	Enable integration and systematisation of DPP	Design	<i>KJ-analysis/They want a digital tool/2 Kinnarps & Balzar & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Could have
11	G	Connect how the company's possibilities can increase customer value	Help increased customer appreciation	Information	<i>KJ-analysis/ Customer value is important to the companies/All & Lit.study/En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling & "Designing the Business Models for Circular Economy—Towards the Conceptual Framework"</i>	Should have
11,1	R	Communicate environmental footprint of the new CBM	Help understanding of transition's results	Information	<i>KJ-analysis/ Customer value is important to the companies/2 Kinnarps, Balzar</i>	Should have
11,12	R	Inform about improved carbon foot print when choosing between strategies	Help understanding of transition's results	Information	<i>KJ analysis 2/Missing information in the tool/3 Kinnarps, Gemla, Ragnars</i>	Should have
11,2	R	Help communicate results related to customer value	Help increased customer appreciation	Information	<i>KJ-analysis/ Customer value is important to the companies/4 Kinnarps, Balzar, Djerf, Ragnars</i>	Should have
11,3	R	Include sustainability metrics dashboard of new business model during development	Ease the understanding of the new CBM results	Function	<i>Lit. study/EEB, Cirkulär Trä PP</i>	Could have
12	R	Include next step of process of transition	Enable clear steps for progress	Information	<i>KJ analysis 2/Missing information in the tool/1 Kinnarps</i>	Should have
12,1	G	Enable comparison between business models before and after transition	Enable clear steps for progress	Information	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Should have
12,11	G	Highlight the changes from the transition	Enable clear steps for progress	Information	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Should have
12,12	G	Highlight the changes where focus is needed	Enable clear steps for progress	Information	<i>Lit. study/Visualizing Business Model Evolution with the Business Model Canvas</i>	Could have

12,13	G	Include alerts and guidance for high-priority actions for transitioning	Enable clear steps for progress	Function	Lit. study/Mirka2023, KansLöfving2023	Should have
13	G	Work as unified platform for the businesses stakeholder	Enables use of multiple stakeholders simultaneously	Smaller function	KJ-analysis/They want a digital tool	Could have
13,1	G	Enable collaborative modeling in the development of the new CBM	Enable shared sensemaking and aligned action	Smaller function	Lit. study/Software tools for business model innovation: current state and future challenges	Could have
13,2	G	Enable commenting and annotation	Enable shared sensemaking and aligned action	Smaller function	Lit. study/Software tools for business model innovation: current state and future challenges	Could have
13,3	G	Include a collaboration & communication module	Enable shared sensemaking and aligned action	Smaller function	Lit. study/Kans & Löfving (2023), Mirka2023	Could have
14	R	Highlight on where expenses can be minimised	Helps prioritise decisions from economics	Information	KJ-analysis/SMEs have more difficulty with money/4 Balzar, Gemla, Kinnarps, Ragnars	Should have
15	R	Include external methods (e.g. BMC, Value proposition canvas, asset management system)	Increase trust in tool with recognised methods	Smaller function	KJ-analysis/They want a digital tool/2 Kinnarps, Ragnars & KJ analysis 2/Missing information in the tool/3 Kinnarps, Gemla, Ragnars	Could have
15,1	G	Comparison of different external methods	Improve better choices and stronger strategies	Information	Lit. study/Software tools for business model innovation: current state and future challenges	Could have
15,2	R	Support multi-framework process	System scalability and multiple ways of working	Smaller function	Lit. study/Software tools for business model innovation: current state and future challenges	Could have
15,3	R	Enable Integration with external databases (materials, suppliers)	System scalability and multiple ways of working	Smaller function	Lit.study/Circularise blog, Kans & Löfving	Could have
16	G	Support internal and external community/network	Enable peer learning and shared knowledge within the business	Function	Lit. study/Implementation of Circular Economy Business Models by SMEs	Could have
16,1	G	Enable external collaboration between companies	Increase circularity from companies to business	Smaller function	KJ-analysis/They want a digital tool/1 Balzar	Could have
16,2	G	Encourage knowledge-sharing spaces	Enable peer learning and shared knowledge within the business	Information	Lit. study/Implementation of Circular Economy Business Models by SMEs	Could have
16,21	R	Include use of workshop to execute the tasks	Enable peer learning and shared knowledge within the business	Information	KJ analysis 2/Missing information in the tool/1 Ragnars	Should have
16,3	G	Include support to internally communicate change	Enable peer learning and shared knowledge within the business	Smaller function	Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin	Could have
17	R	Enable usage of the tool after development of new business model	Increase trust in tool and the process	Function	KJ-analysis/They want a digital tool/ 2 Cluster/Ragnars	Could have
17,1	R	Show progression status in transition to new CBM after development	Minimise cognitive load and maximise user confidence	Information	Lit. study/Software tools for business model innovation: current state and future challenges & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin	Won't have
17,2	R	Enable integration of leasing/service models	Ease the process of developing a new CBM	Smaller function	Lit. study/KansLöfving2023, CirkuTrä PP	Won't have
18	G	Make process of CBM development easily followed	Ease the process of developing a new CBM	Information	KJ-analysis/To change business model is a complex process/All	Must have
18,1	R	Include stepwise transition structure after development of new CBM	Minimise cognitive load	Function	Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin	Could have
18,11	R	Process include steps based on users' reality	Ensure possibility of implementation in reality	Information	KJ-analysis/To change business model is a complex process/1 Cluster (indirekt alla)	Could have

18,2	R	Show progression in development of CBM	Minimise cognitive load	Information	Lit. study/Software tools for business model innovation: current state and future challenges & Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Implementation of Circular Economy Business Models by SMEs	Should have
18,3	G	Offer clarity in the understanding of the tasks within the process	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
18,31	R	Offer introduction of the tool and its tasks	Ease use for real-world application	Function	KJ analysis 2/Need for greater interface clarity/2 Kinnarps, Ragnars	Should have
18,32	R	Offer clarity of what the results are based on	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/2 Kinnarps, Gemla	Must have
18,33	R	Offer understanding of how to execute the tasks	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/1, Gemla	Must have
18,34	R	Offer understanding of what type of answers are expected	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/2 Kinnarps, Gemla	Must have
18,35	R	Offer deeper understanding of what the questions means	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
18,4	G	Enable foundational understanding of the process	Ease the process of developing a new CBM	Information	KJ analysis 2/Trusts the tool/2 Kinnarps, Gemla	Must have
19	R	Encourage systematized production structure after development of new CBM	Ease the practical work of the new CBM	Information	KJ-analysis/They need systematics/All & Lit. study/En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling	Could have
19,1	R	Help development of who does what	Ease the practical work of the new CBM	Smaller function	KJ-analysis/They need systematics/All	Could have
19,2	R	Help development of what steps are needed in production	Ease the practical work of the new CBM	Smaller function	KJ-analysis/They need systematics/All	Could have
19,3	R	Help development of what material is needed	Ease the practical work of the new CBM	Smaller function	KJ-analysis/They need systematics/All	Could have
20	R	Help understanding of necessary action when growth in demand occurs	Increase understanding of needed adjustments	Information	KJ-analysis/Higher demand meand adjustment of larger scale/2 Kinnarps & Ragnars	Should have
21	G	Support SMEs	Increase real-world usability	Information	Lit. study/Implementation of Circular Economy Business Models by SMEs	Must have
21,1	R	Comply to low frequency of joint meetings within the company	Enables work without changing company's meeting structure	Information	KJ-analysis/They rarely have meetings regarding circularity/1 Balzar Scope & KJ-analysis/To change business model is a complex process - there are always improvements possible/ All exc Ragnars & Lit. study/Kans & Löfving (2023), Cirkulär Trä PP	Should have
22	R	Enable evaluation of new CBM for potential improvements	Ensure possibility of continued work	Function	KJ-analysis/To change business model is a complex process - there are always improvements possible/ All exc Ragnars & Lit. Study/ "CHALLENGES OF THE INTRODUCTION OF CIRCULAR BUSINESS MODELS WITHIN RURAL SMES OF EU"	Could have
22,2	G	Support low digital maturity	Ease use for real-world application	Design	Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & "Framgångsrik affärsmodellinnovation" KJ analysis 2/Need for greater interface clarity/2 , Ragnars, Gemla	Should have

22,21	G	Include low digital complexity	Ease use for real-world application	Design	Lit. study/Digital transformation och företagsöverlevnad i möbelindustrin & Lit. study/Visualizing Business Model Evolution with the Business Model Canvas	Must have
22,22	G	Offer clarity in interface	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
22,221	R	Explain the usage of the tool	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/1 Gemla	Must have
22,222	R	Explain what is presented in the interface	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
22,223	R	Offer clarity of where the user is in the interface	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/1 Gemla	Must have
22,224	G	Offer clear correlation between functions' design and their actions	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/2 , Ragnars, Gemla	Must have
22,2241	G	Offer clear understanding of which are clickable elements	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/1 Kinnarps	Must have
22,2242	G	Offer clear understanding of which are unclickable elements	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/1 Kinnarps	Must have
22,225	G	Offer consistency within the interface	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
22,226	G	Offer consistency within layouts	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
22,227	G	Offer consistency with automatic actions within the interface	Ease use for real-world application	Design	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
22,228	G	Offer consistency in descriptions	Ease use for real-world application	Information	KJ analysis 2/Need for greater interface clarity/3 Kinnarps, Ragnars, Gemla	Must have
23	R	Demand little time of the company's everyday work	Enables work without changing company's working structure	Function	KJ-analysis/Time is a limited factor/All	Should have
24	R	Comply to process needing time to be realised	Sets reasonable demands and expectations for the process	Information	KJ-analysis/Time is a limited factor & To change business model is a complex process - It takes time to switch /All & Cluster, Kinnarps, Ragnars KJ analysis 2/Took their time/3 Kinnarps, Ragnars, Gemla	Must have
25	R	Get examples and inspiration of others' transitions	Facilitates ideas and trust for a new CBM	Information	KJ analysis/They get inspired from others CBMs/4 Balzar, Cluster, Materia, Ragnars	Must have
26	G	Bring an understanding why it's worth it for the business	Increase trust in the new CBM	Information	KJ-analysis/SMEs have more difficulty with money/4 Balzar, Gemla, Kinnarps, Ragnars	Must have
26,1	R	Present economic effect of new business model to the company	Increase understanding and trust in the new CBM for the company's gain	Information	KJ-analysis/SMEs have more difficulty with money/4 Balzar, Gemla, Kinnarps, Ragnars & KJ-analysis/Business focus on economic growth/All	Must have
27	R	Include educations or educating material	Increases understanding and facilitates ideas for new CBMs	Information	KJ analysys/Appriciates new perspectives/1 Ragnars & Lit. study/Kans & Löfving (2023), Gemla Möbler case & "CHALLENGES OF THE INTRODUCTION OF CIRCULAR BUSINESS MODELS WITHIN RURAL SMES OF EU"	Could have
27,1	G	Encourage community learning spaces	Foster knowledge exchange for faster adoption	Information	Lit. study/Implementation of Circular Economy Business Models by SMEs	Could have
28	R	Enable understanding of rotated roles in the new business model	Minimise worry within the company for the upcoming changes	Information	KJ analysis/The business feels a worry for new business models/1 Kinnarps	Could have
29	R	Ensure that the process is adjustable to their available resources	Ease work in deciding upon new CBM	Function	KJ analysis/Limited to the business possibilities/6 all	Should have

29,1	R	Enable action-oriented interaction related to entered data	Ease work in deciding upon new CBM	Function	Lit. study/Visualizing Business Model Evolution with the Business Model Canvas	Must have
30	R	Enable easy extraction of information for analogue presentation and discussion	Enable analogue discussion and presentation	Smaller function	KJ analysis/Businesses use different systems-Businesses discuss analogue and digital/1 Balzar (fler pratat om det men ej där)	Could have
31	G	Enable following the market's circularity	Ensure relevance in chosen business model	Information	KJ-analysis/To change business model is a complex process - Follows the development of circularity/ All & Lit. Study/ "CHALLENGES OF THE INTRODUCTION OF CIRCULAR BUSINESS MODELS WITHIN RURAL SMES OF EU"	Won't have
31,1	R	Enable following customer needs	Ensure relevance for the in chosen business model	Information	KJ-analysis/Customer needs control the market/All & Lit. study/DESIGN FÖR DEMONTERING TILLÄMPAT PÅ KONTORSMÖBLER	Won't have
31,2	R	Include analysis of market demand	Improve product-market fit	Information	Lit. study/TMF, Möbelnationen, 2018	Could have
31,2	R	Include benchmarking against industry best practices	Enable comparison with circular businesses	Information	Lit. study/Mirka2023, Drott & Örnelev (2026)	Could have
31,3	R	Include large enterprise benchmarking	Enable comparison with circular businesses	Information	Lit. study/EU SME Definition	Won't have
32	R	Enable customer contact	Help inclusion in the product's full life cycle	Function	KJ-analysis/Companies want more contact with custoemrs/All & Lit. study/ "Designing the Business Models for Circular Economy—Towards the Conceptual Framework"	Could have
32,1	R	Enable knowing who has their sold products	Help inclusion in the product's full life cycle	Function	KJ-analysis/Want to be able to track forwards/2 Djerf & Kinnarps	Could have
32,2	R	Enable retrieving their products at the end of their life cycle	Ease prolonging product's lifespan	Function	KJ-analysis/Want to be able to track forwards/3 Djerf, Balzar & Kinnarps	Could have
32,3	G	Help understand customer needs through customer contact	Ease business' relevance	Function	KJ-analysis/Customer needs control the market/Djerf	Won't have
33	G	Help increase knowledge of circularity within the company	Increase understanding of transition and its worth	Information	KJ-analysis/Missing knowledge of circularity in Competence is a limited factor/4 Djerf, Ragnars, Balzar & Cluster	Must have
33,1	G	Increase knowledge about circular economy	Bridge knowledge gap och circular economy	Information	Lit. study/Kartläggning Mirka Kans, Malin Löfving	Must have
33,2	G	Increase knowledge about remanufacturing of furniture	Bridge knowledge gap och circular economy	Information	Lit. study/Kartläggning Mirka Kans, Malin Löfving & "Hållbarhetsanalys av cirkulära möbelflöden"	Must have
34	R	Focus on adding an additional business model instead of a full switch	Ease starting point of transition	Information	KJ-analysis/They see CBM as a side track/All	Must have
35	G	Offer something the company cannot do without it	Ensure the neccessity of the tool	Function	KJ-analysis/They want a digital tool /1 Cluster	Must have
36	R	Inform of the importance of marketing	Increase market recognition of company	Information	KJ-analysis/Marketing is important/5 all except Cluster & Lit. study/En Cirkulär Möbelindustri - Affärsmodellens betydelse i Materias hållbara utveckling	Should have
36,1	R	Help with structure of results for future marketing	Ease decision on marketing focus	Function	KJ-analysis/Marketing is important/5 all except Cluster	Could have
37	R	Highlight important steps in the business model and when they should be done depending on chosen strategy	Ease the practical work of the new CBM	Information	KJ analysis/Earlier assessment of condition helps logistic/3 Materia, Balzar, Kinnarps	Could have

37,1	R	Enable understanding of when a first assessment of remanufacturing a furniture should be done	Minimize company's time and effort in process of remanufacturing	Information	<i>KJ analysis/Earlier assessment of condition helps logistic/3 Materia, Balzar, Kinnarps</i>	Won't have
37,2	R	Enable understanding of how to learn from their products' damages from use	Ease the practical work of the new CBM	Information	<i>KJ analysis/Product quality is important/3 Gemla, Balzar, Kinnarps</i>	Could have
37,3	G	Include support for modular product assessment & decision-making	Ease the practical work of the new CBM	Smaller function	<i>Lit. study/CirkuTrä PP, Gemla Möbler case; & Lit. study/Remanufacturing Furniture: Mapping the Process Flow and Assessing Environmental Impact.</i>	Could have
38	R	Highlight benefits and drawbacks of all strategies to choose from	Ease decision of strategy	Information	<i>KJ analysis/Product quality is important/3 Gemla, Balzar, Kinnarps</i>	Should have
38,1	R	Highlight benefits of product quality to extend product life cycle	Increase understanding of quality importance	Information	<i>KJ analysis/Product quality is important/3 Gemla, Balzar, Kinnarps & Lit. study/Svenskt Trä, Snickerihandbok & Lit. Study/ "CHALLENGES OF THE INTRODUCTION OF CIRCULAR BUSINESS MODELS WITHIN RURAL SMES OF EU"</i>	Could have
38,2	R	Highlight benefits of modularity to extend product life cycle	Increase understanding of modularity importance	Information	<i>Lit. study/Hållbarhetsanalys av cirkulära möbelflöden & KJ analysis/Product quality is important/3 Gemla, Balzar, Kinnarps</i>	Could have
39	R	Enable understanding of which stakeholders need to be involved in transition	Include all relevant stakeholders	Information	<i>KJ-Analysis/Several stakeholders are involved in transition/All</i>	Should have
39,1	R	Enable understanding of which external stakeholders need to be involved in transition	Include relevant external stakeholders	Information	<i>KJ-Analysis/Several stakeholders are involved in transition/5 All ex Gemla</i>	Should have
39,2	R	Enable mapping of supply chain network	Smoother circular adoption	Smaller function	<i>Lit. study/TMF, 2020</i>	Won't have
39,3	R	Enable understanding of which internal stakeholders need to be involved in transition	Include relevant internal stakeholders	Information	<i>KJ-Analysis/Several stakeholders are involved in transition/Balzar, Gemla, Kinnarps</i>	Should have
40	R	Adaptable to different digital systems	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/All</i>	Could have
40,1	R	Adaptable to different internal business systems	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/3 Cluster, Kinnarps, Gemla</i>	Could have
40,2	R	Adaptable to Office365	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/5 Cluster, Materia, Gemla, Balzar, Ragnars</i>	Could have
40,21	R	Adaptable to Teams	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/1 Cluster</i>	Could have
40,22	R	Adaptable to Excel	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/4 Materia, Gemla, Cluster, Balzar</i>	Could have
40,23	R	Adaptable to Sharepoint	Enable use within different systems	Design	<i>KJ analysis/Businesses use different systems/1 Materia</i>	Could have
41	R	Inform of multiple ways of thinking and doing the tasks	Increase understanding of what is expected of the user	Information	<i>KJ analysis 2/Missing information in the tool/1 Gemla</i>	Should have
41,1	R	Inform of what the cost/revenue should cover	Understand how to think when entering costs/revenues	Information	<i>KJ analysis 2/Missing information in the tool/1 Gemla</i>	Should have
42	R	Include source of information	Enable traceability and further researching of strategies	Information	<i>KJ analysis 2/Missing information in the tool/1 Kinnarps</i>	Should have
42,1	R	Include source of why the strategy is worth it	Enable traceability and further researching of strategies	Information	<i>KJ analysis 2/Missing information in the tool/1 Kinnarps</i>	Should have
43	G	Enable multiple navigational paths through the tool	Adhere to different mental models depending on user	Function	<i>KJ analysis 2/Good to enable different ways of navigating/2 Kinnarps, Ragnars</i>	Must have
43,1	R	Enable choosing strategy directly from the list	Adhere to different mental models depending on user	Function	<i>KJ analysis 2/Good to enable different ways of navigating/1 Ragnars</i>	Should have

43,2	R	Enable handling lists in multiple ways	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/1 Ragnars	Must have
43,3	R	Enable confirming automatic pop-up to close	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/1 Kinnarps	Should have
43,4	R	Enable closing pop-up with closing icon	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/2 Gemla, Ragnars	Must have
43,5	R	Enable navigation through overview cards	Adhere to different mental models depending on user	Function	KJ analysis 2/Good to enable different ways of navigating/1 Kinnarps	Must have
44	R	Inform where the entered information is saved and how you reach it	Increase transparency and understanding of the tool	Information	KJ analysis 2/Good to enable different ways of navigating/1 Ragnars	Must have
45	R	Include summary of replies of the step	Enable understanding and overview of previous actions	Information	KJ analysis 2/Appreciation for summaries/3 Kinnarps, Ragnars, Gemla	Must have
45,1	R	Include summary of replies of the step in its overview	Enable understanding and overview of previous actions	Information	KJ analysis 2/Appreciation for summaries/2 Kinnarps, Gemla	Must have
46	R	Enable comparison of strategies	Ease the decision of strategy	Function	KJ analysis 2/Trusts the tool/1 Kinnarps	Should have
46,1	G	State clear differences between strategies	Increase understanding of strategies	Information	KJ analysis 2/Missing information in the tool/1 Gemla & KJ analysis 2/Missing information in the tool/2 Kinnarps, Gemla	Must have
46,2	G	Enable mapping of strategies for the company	Enable comparison of strategies	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Could have
46,21	G	Enable inclusion of KPI in the mapping of strategies	Enable comparison of strategies	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Could have
46,22	G	Enable inclusion of SWOT-analysis in the mapping of strategies	Enable comparison of strategies	Information	KJ analysis 2/Missing information in the tool/1 Kinnarps	Could have
47	R	Enable automation of the results based on the replies throughout the process	Ease the process of developing a new CBM	Information	KJ analysis 2/Trusts the tool/1 Ragnars	Must have
48	R	Enable changing the visualisation of the current business model	Ensure correct data entry	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
48,1	R	Enable changing the visualisation of the current business model through multiple actions	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
48,11	R	Enable drag and drop--function to move blocks	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
48,12	R	Enable removing blocks	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
48,13	R	Enable adding blocks	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
48,14	R	Enable copying blocks	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
48,15	R	Enable moving block through arrows	Adhere to different mental models depending on user	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/3 Kinnarps, Ragnars, Gemla	Must have
48,16	R	Enable complex building of BM in several layers	Enable deeper handling of the process	Function	KJ analysis 2/Multiple ways of editing the business model is appreciated/1 Ragnars	Should have
49	R	Enable working with several strategies in one process	Enable deeper handling of the process	Function	KJ analysis 2/Want to work with multiple strategies simultaneously/3 Kinnarps, Ragnars, Gemla	Won't have
50	R	Enable prioritisation of the available strategies	Ease the decision of strategy	Function	KJ analysis 2/Want to prioritize among strategies/3 Kinnarps, Ragnars, Gemla	Should have

50,1	R	Enable prioritisation of the relevant strategies	Ease the decision of strategy	Information	<i>KJ analysis 2/Want to prioritize among strategies/2 Kinnarps, Ragnars</i>	Should have
50,2	R	Enable visual deprioritize irrelevant strategies	Ease the decision of strategy	Function	<i>KJ analysis 2/Want to prioritize among strategies/3 Kinnarps, Ragnars, Gemla</i>	Should have
50,3	R	Enable visual prioritisation among strategies	Ease the decision of strategy	Function	<i>KJ analysis 2/Want to prioritize among strategies/3 Kinnarps, Ragnars, Gemla</i>	Should have

L

Script First Individual Interview

This appendix presents the interview script used in the first interview of the Contextual Phase. Following this session, the script was revised - the updated version is presented in Appendix M. The script is kept in its original Swedish, as it was used during the session. The six areas presented match the one described and presented in Chapter 6.

Hej!

Hur är det med dig idag?

Tack så hemskt mycket för att du vill vara med och hjälpa till här i vårt exjobb, verkligen uppskattar det!

I vårt projekt ska vi ju som vi skrev i mailet ta fram ett digitalt verktyg för möbeltillverkare så att de kan följa frameworken som CirkuTrä och ReFurn har utvecklat, för att kunna implementera en cirkulär affärsmodell som funkar utifrån hur de gör sina affärer idag.

Vi är inne på fjärde veckan så vi håller på att försöka fördjupa oss massor i ämnet och få förståelse för användarna, och [] gav oss ditt namn iom att du varit med tidigare och också har bra koll som [roll].

Upplägget är ganska löst idag, mer att vi gärna vill prata lite och få förståelse för ert arbete kring cirkularitet och vad som kan va svårt och viktigt

Går det bra att vi spelar in bara med röst för att vi ska kunna gå tillbaka till det senare om vi missar någonting? Vi kommer behålla inspelningen och informationen tills projektet är slut i juni. Om det går bra skickar vi pdf för samtycke på din mail sen som du gärna får skriva på och skicka tillbaka.

Perfekt, då kör vi lite då, och om du undrar någonting är det verkligen bara att fråga eller stoppa oss när som!

Viktigaste frågor (om tiden blir kort)

Om bara hinner 6 frågor, välj:

- Vad är svårast med att implementera en cirkulär affärsmodell?
- Vilka steg var/är viktigast för att gå från linjärt till cirkulärt?
- Vilket stöd saknas idag?
- Vad skulle ett digitalt verktyg behöva göra?
- Vilka är användarna av ett sådant verktyg?
- Drömscenario?

1. Roll och kontext (för att placera)

Syfte: förstå perspektiv och ansvar.

1. Kan du kort berätta om din roll som [roll] på [företag]?
 - a. Sitter du i [stad]?
2. Hur ser ditt arbete med cirkularitet och affärsutveckling ut i praktiken?

2. Ert cirkulära arbete idag (nuläge)

Syfte: förstå vad de redan gör.

3. Hur arbetar ni med cirkulära strategier idag, har ni någon cirkulär affärsmodell eller tjänst du kan beskriva?
 - a. Är det ett sidospår eller en central strategi, vad händer med det som inte är inkluderat i den modellen?
 - i. Varför är det inte er centrala strategi?
 - b. Hur kommer det sig att ni inte utvecklat någon cirkulär affärsmodell?

3. Övergången från linjärt till cirkulärt (förändringsresa)

Syfte: få berättelsen om “hur switchar man?”

4. Alternativ:
 - a. OM HAR (som används):
 - i. Hur gick processen till när ni började utveckla er cirkulära affärsmodell?
 - b. OM INTE HAR:
 - i. Hur ser ni att övergången till en cirkulär affärsmodell skulle kunna se ut hos er i framtiden?
 1. Har ni bytt affärsmodell tidigare? Hur såg det ut?
5. Vilka steg skulle du säga är viktigast för att få igång en ny cirkulär affärsmodell?

4. Utmaningar och hinder i praktiken

Syfte: detta är kärnan för verktyget.

6. Vad är det svåraste med att implementera ny cirkulär affärsmodell i praktiken idag (tycker/tror du)?
(t.ex. möjligheten att följa den, logistik, kostnader, rutiner, kundbeteende)
7. Vilka resurser är mest begränsande för ett SME som er [*/de inom er koncern*]?
 - tid?
 - kompetens?
 - ekonomi?
 - systemstöd?

5. Verktyg, metoder och stöd idag

Syfte: kartlägga vad de använder nu och vad som saknas.

8. Vilka verktyg eller metoder använder ni idag för att jobba generellt, eller med affärsmodeller och cirkularitet?
 - (Excel, workshops, interna system, Business Model Canvas?)
9. Har ni fått något praktiskt ut av CirkuTrä/RE:FURN-samarbetet hittills?

- något ni använder idag? Hur?
 - något som blev svårt att omsätta? Varför?
10. Saknar ni något slags stöd i vardagen för att ta nästa steg?

6. Behov för ett digitalt verktyg

Syfte: konkret designinput & vision och riktning.

11. Om det fanns ett digitalt verktyg som stödjer övergången till en cirkulär affärsmodell – vad skulle det hjälpa er med?
12. Vilka funktioner skulle vara mest värdefulla i ett sånt verktyg?
- Exempel:
- guida steg-för-steg
 - aktörskarta
 - processflöden
 - beslutsstöd kring prissättning
 - checklistor
13. Vad skulle göra ett sådant verktyg lätt att använda i praktiken?
- Hur skulle ett "drömscenario" se ut för att kunna följa er cirkulära affärsmodell?
 - Hur är det implementerbart i er arbetsvardag?

Avslutning

Så då var vi klara! Som sagt, tack så otroligt mycket för att du tog dig tid för detta och ville hjälpa oss!

- Vi har i dagsläget tänkt att vi kommer försöka hålla lite tester på verktyg som vi tar fram prototypen på om några veckor, förhoppningsvis runt vecka 13.
 - Är det något vi skulle kunna höra av oss med till dig om du skulle vilja vara med i de testerna?
 - I så fall är planen att vi kommer ut till er för dessa tester.
 - Vi har sett att det är en mässadär, Elmia Cirkulär, vi ska försöka ta oss till den, är det något ni ska ta del av?
- Toppen! Det här har varit så så hjälpsamt för oss!
- Går det bra att vi hör av oss vidare om vi har några frågor eller något annat?

M

Script Individual Interviews

This appendix presents the revised script used in the individual interviews, except the first, in the Contextual Phase. The script is kept in its original Swedish, as it was used during the sessions. The six areas presented match the one described and presented in Chapter 6.

Hej!

Hur är det med dig idag?

Tack så hemskt mycket för att du vill vara med och hjälpa till här i vårt exjobb, verkligen uppskattar det!

I vårt projekt ska vi ju som vi skrev i mailet ta fram ett digitalt verktyg för möbeltillverkare så att de kan följa frameworken som CirkuTrä och ReFurn har utvecklat, för att kunna implementera en cirkulär affärsmodell som funkar utifrån hur de gör sina affärer idag.

Vi är inne på femte veckan så vi håller på att analysera lite intervjuer och få förståelse för er som potentiella användare, och [] gav oss ditt namn om att du varit med tidigare och också har bra koll som [roll].

Upplägget är ganska löst idag, mer att vi gärna vill prata lite och få förståelse för ert arbete kring cirkularitet och vad som kan va svårt och viktigt

Går det bra att vi spelar in bara med röst för att vi ska kunna gå tillbaka till det senare om vi missar någonting? Vi kommer behålla inspelningen och informationen tills projektet är slut i juni, eller tills du ber oss ta bort det. Om det går bra skickar vi pdf för samtycke på din mail sen som du gärna får skriva på och skicka tillbaka.

Perfekt, då kör vi lite då, och om du undrar någonting är det verkligen bara att fråga eller stoppa oss när som!

Viktigaste frågor (om tiden blir kort)

Om bara hinner 6 frågor, välj:

- Vad är svårast med att implementera en cirkulär affärsmodell?
- Vilka steg var/är viktigast för att gå från linjärt till cirkulärt?
- Vilket stöd saknas idag?
- Vad skulle ett digitalt verktyg behöva göra?
- Vilka är användarna av ett sådant verktyg?
- Drömscenario?

1. Roll och kontext (för att placera)

Syfte: förstå perspektiv och ansvar.

1. Kan du kort berätta om din roll som [roll] på [företag]?
 - a. Sitter du i [företag] eller någon annanstans?
2. Hur ser ditt arbete med cirkularitet och affärsutveckling ut i praktiken vardagen?

2. Ert cirkulära arbete idag (nuläge)

Syfte: förstå vad de redan gör.

3. Hur arbetar ni med cirkulära strategier idag, har ni någon cirkulär affärsmodell eller tjänst du kan beskriva?
 - a. Är det ett sidospår eller en central strategi, vad händer med det som inte är inkluderat i den modellen?
 - i. Varför är det inte er centrala strategi?
 - b. Hur kommer det sig att ni inte utvecklat någon cirkulär affärsmodell?

3. Övergången från linjärt till cirkulärt (förändringsresa)

Syfte: få berättelsen om “hur switchar man?”

4. Hur jobbar ni med affärsmodeller i vardagen?
5. Alternativ:
 - a. OM HAR (som används):
 - i. Hur gick processen till när ni började **utveckla** er cirkulära affärsmodell?
 - b. OM INTE HAR:
 - i. Hur ser ni att övergången till en cirkulär affärsmodell skulle kunna se ut hos er i framtiden?
 1. Har ni bytt affärsmodell tidigare? Hur såg det ut?
6. Vilka steg skulle du säga är viktigast för att få igång en ny cirkulär affärsmodell?

4. Utmaningar och hinder i praktiken

Syfte: detta är kärnan för verktyget.

7. Vad är det svåraste med att **implementera** ny cirkulär affärsmodell i praktiken idag (tycker/tror du)?
(lex.möjligheten att följa den, logistik, kostnader, rutiner, kundbeteende)
7. Vilka resurser är mest begränsande för ett SME som er [/de inom er koncern]?
 - tid?
 - kompetens?
 - ekonomi?
 - systemstöd?

5. Verktyg, metoder och stöd idag

Syfte: kartlägga vad de använder nu och vad som saknas.

8. Vilka verktyg eller metoder använder ni idag för att jobba generellt, eller med affärsmodeller och cirkularitet?
 - (Excel, workshops, interna system, Business Model Canvas?)

9. Har ni fått något praktiskt ut av CirkuTrä/RE:FURN-samarbetet hittills?
 - något ni använder idag? Hur?
 - något som blev svårt att omsätta? Varför?
10. Saknar ni något slags stöd i vardagen för att ta nästa steg mot cirkularitet?

6. Behov för ett digitalt verktyg

Syfte: konkret designinput & vision och riktning.

11. Hur kan verktyg hjälpa er
 - Om vi ponerar att ni idag har en linjär affärsmodell - hur skulle ett digitalt verktyg kunna hjälpa er att ta fram en cirkulär
 - Om det fanns ett digitalt verktyg som stödjer övergången till en cirkulär affärsmodell – vad skulle det hjälpa er med?
12. Vilka funktioner skulle vara mest värdefulla i ett sånt verktyg?
Exempel:
 - guida steg-för-steg
 - aktörskarta
 - processflöden
 - checklistor
13. Vad skulle göra ett sådant verktyg lätt att använda i praktiken?
 - Hur skulle ett "drömscenario" se ut för att kunna följa er cirkulära affärsmodell?
 - Vad gör det implementerbart i er arbetsvardag?

Avslutning

Så då var vi klara! Som sagt, tack så otroligt mycket för att du tog dig tid för detta och ville hjälpa oss!

- Vi har i dagsläget tänkt att vi kommer försöka hålla lite tester på verktyg som vi tar fram prototypen på om några veckor, förhoppningsvis runt vecka 13.
 - Är det något vi skulle kunna höra av oss med till dig om du skulle vilja vara med i de testerna?
 - I så fall är planen att vi kommer ut till er för dessa tester.
 - Vi har sett att det är en massa där, Elmia Cirkulär, vi ska försöka ta oss till den, är det något ni ska ta del av?
- Toppen! Det här har varit så så hjälpsamt för oss!
- Går det bra att vi hör av oss vidare om vi har några frågor eller något annat?

N

Script Group Interviews

This appendix presents the group interview scripts used in the Contextual Phase. The scripts are kept in their original Swedish, as they were used during the sessions. This was used as a base for this semi-structured interview to discuss around.

Hej!

Hur är det med dig idag?

Tack så hemskt mycket för att du vill vara med och hjälpa till här i vårt exjobb, verkligen uppskattar det!

I vårt projekt ska vi ju som vi skrev i mailet ta fram ett digitalt verktyg för möbeltillverkare så att de kan följa frameworken som CirkuTrä och ReFurn har utvecklat, för att kunna implementera en cirkulär affärsmodell som funkar utifrån hur de gör sina affärer idag.

Vi är inne på fjärde veckan så vi håller på att försöka fördjupa oss massor i ämnet och få förståelse för användarna, och [] gav oss ditt namn eftersom att du varit med tidigare lite i projekten.

Upplägget är ganska löst idag, mer att vi gärna vill prata lite och få förståelse för ert arbete kring nya affärsmodeller och vad som kan va svårt och viktigt

Går det bra att vi spelar in bara med röst för att vi ska kunna gå tillbaka till det senare om vi missar någonting? Vi kommer behålla inspelningen och informationen tills projektet är slut i juni. Om det går bra skickar vi pdf för samtycke på din mail sen som du gärna får skriva på och skicka tillbaka.

Perfekt, då kör vi lite då, och om du undrar någonting är det verkligen bara att fråga eller stoppa oss när som!

Viktigaste frågor (om tiden blir kort)

Om bara hinner 6 frågor, välj:

- Vad är svårast med att implementera en cirkulär affärsmodell?
- Vilka steg var/är viktigast för att gå från linjärt till cirkulärt?
- Vilket stöd saknas idag?
- Vad skulle ett digitalt verktyg behöva göra?
- Vilka är användarna av ett sådant verktyg?
- Drömscenario?

1. Roll och kontext (för att placera)

Syfte: förstå perspektiv och ansvar.

1. Kan du kort berätta om era roller på [] som
 - a. Vart sitter ni någonstans?
 - b. Hur tätt jobbar ni med företagen?
2. Hur ser ert arbete med cirkularitet och affärsutveckling ut i praktiken?

2. Ert cirkulära arbete idag (nuläge)

Syfte: förstå vad de redan gör.

3. Hur arbetar ni med cirkulära strategier idag, har ni någon cirkulär affärsmodell eller tjänst du kan beskriva? Är det ett sidospår eller en central strategi, vad händer med det som inte är inkluderat i den modellen?
 - i. Varför är det inte er centrala strategi?
 - b. Hur kommer det sig att ni inte utvecklat någon cirkulär affärsmodell?
 - c. Hur fungerar det generellt :)

3. Övergången från linjärt till cirkulärt (förändringsresa)

Syfte: få berättelsen om “hur switchar man?”

4. Hur jobbar ni med affärsmodeller?
5. Alternativ:
 - a. OM HAR (som används):
 - i. Hur gick processen till när ni började **utveckla** cirkulära affärsmodell?
 - b. OM ANDRA HAR (som används):
 - i. Hur har ni upplevt att processen till när de började **utveckla** cirkulära affärsmodell?
 - c. OM INTE HAR:
 - i. Hur ser ni att övergången till en cirkulär affärsmodell skulle kunna se ut hos er i framtiden?
 1. Har ni bytt affärsmodell tidigare? Hur såg det ut?
6. Vilka steg skulle ni säga är viktigast för att få igång en ny cirkulär affärsmodell?

4. Utmaningar och hinder i praktiken

Syfte: detta är kärnan för verktyget.

7. Vad är det svåraste med att **implementera** ny cirkulär affärsmodell i praktiken idag (tycker/tror du)?
([lex](#). möjligheten att följa den, logistik, kostnader, rutiner, kundbeteende)
8. Vilka resurser är mest begränsande för ett SME som er *[/de inom er koncern]*?
 - tid?
 - kompetens?
 - ekonomi?
 - systemstöd?

5. Verktyg, metoder och stöd idag

Syfte: kartlägga vad de använder nu och vad som saknas.

8. Vilka verktyg eller metoder används idag för att jobba generellt, eller med affärsmodeller och cirkularitet?
 - (Excel, workshops, interna system, Business Model Canvas?)
9. Har ni fått något praktiskt ut av CirkuTrä/RE:FURN-samarbetet hittills?
 - något ni använder idag? Hur?
 - något som blev svårt att omsätta? Varför?
10. Saknar ni/märker ni att något slags stöd i vardagen för att ta nästa steg mot en mer cirkulär affärsmodell?

6. Behov för ett digitalt verktyg

Syfte: konkret designinput & vision och riktning.

11. Hur kan verktyg hjälpa er/företagen i framtagandet av affärsmodell
 - Om vi ponerar att ni idag har en linjär affärsmodell - hur skulle ett digitalt verktyg kunna hjälpa er att ta fram en cirkulär
 - Om det fanns ett digitalt verktyg som stödjer övergången till en cirkulär affärsmodell – vad skulle det hjälpa er med?
12. Vilka funktioner skulle vara mest värdefulla i ett sånt verktyg för att lättare kunna ta fram och följa en affärsmodell?
Exempel:
 - guida steg-för-steg
 - aktörskarta
 - processflöden
 - beslutsstöd kring prissättning
 - checklistor
13. Vad skulle göra ett sådant verktyg lätt att använda i praktiken?
 - Hur skulle ett "drömscenario" se ut för att kunna följa den cirkulära affärsmodellen?
 - Hur är det implementerbart i er arbetsvardag?
 - Vad är viktigt för oss att tänka på för att de i möbelindustrin faktiskt skulle använda verktyget?

Avslutning

Så då var vi klara! Som sagt, tack så otroligt mycket för att ni tog er tid för detta och ville hjälpa oss!

- Vi har i dagsläget tänkt att vi kommer försöka hålla lite tester på verktyg som vi tar fram prototypen på om några veckor, förhoppningsvis runt vecka 13.
 - Är det något vi skulle kunna höra av oss med till dig om ni skulle vilja vara med i de testerna?
 - och jättegärna om ni har företag ni jobbar med som skulle vilja vara med och hjälpa till, gärna som inte redan har övergått till cirkulär affärsmodell.
 - I så fall är planen att vi kommer ut till er för dessa tester.
 - Vi har sett att det är en massa där, Elmia Cirkulär, vi ska försöka ta oss till den, är det något ni ska ta del av?
- Toppen! Det här har varit så så hjälpsamt för oss!

- Går det bra att vi hör av oss vidare om vi har några frågor eller något annat?

O

Script Usability Tests

This appendix presents the Usability test scripts used in the Usability Phase. The scripts are kept in their original Swedish form, as they were used during the sessions. The task number match the ones used in the tables in Chapter 6.

Intro - ca 5 min

Hej!

Tack för att du vill vara med på det här testet, det är så så hjälpsamt för oss.

Nu har vi kommit en bit in i det här projektet och har skapat en prototyp på det här verktyget som du nu kommer att få testa. För att påminna så är det ett verktyg som är till för att hjälpa möbelföretag att **ta fram** en ny affärsmodell som passar just er, med cirkulärt fokus.

Vi har skickat en länk där till dig som tar dig till vår prototyp. Du får jättegärna öppna den nu om du inte har gjort det än. Den går att öppna i en webbläsare så den ska funka utan problem. Den är gjord i ett program som heter Figma och är interaktiv, fast utan programmering bakom så den funkar bara där vi har valt att den ska funka. I detta fallet är den anpassad efter testet och alla funktioner är inte fungerande, bara så du vet. Så är det så att inget händer när du klickar någonstans kan det bero på det.

Vi kommer spela in skärminspelning och ljud för detta, för att kunna se tillbaka på vad som sägs och hur gränssnittet hanteras. Är det okej?

Hur testet kommer gå till är att jag kommer berätta ett scenario. När det är berättat kommer jag be dig utföra uppgifter utifrån scenariot. Det kommer vara tre uppgifter. Efter varje uppgift kommer vi att fråga lite korta frågor om uppgiften också. I slutet kommer vi att ha några generella frågor om hela testet. Så för att se hur du gör med prototypen, skulle du vilja dela din skärm?

När du utför uppgifterna får du jättegärna prata högt om vad du tänker, gör, tycker, vad som helst. Du får gärna även berätta när du känner dig klar med en uppgift. Det är jättehjälpsamt för oss att få höra både positiva men framförallt negativa saker så att vi kan förbättra det. Så säg allt du vill.

Scenario - 1 min

Ni i företaget har sett hur många andra håller på att följa lite mer cirkulära affärsmodeller och ni märker även hur kunderna börjar efterfråga detta lite mer på marknaden. Bland annat därför bestämmer ni er för att ni också vill göra detta. Ni tar hjälp av detta verktyget för att kunna ta fram en ny affärsmodell som kan funka för er utifrån hur ni jobbar idag. Ni har svårt att lita helt på att det kommer gå för er och framför allt hur det skulle gå för er men vill ändå försöka för att se. Ni tar er tid med detta och inkluderar kollegor så att ni går in och ur processen lite, olika personer jobbar med det på olika håll. Till en början är det du som ansvarar för processen och har startat den.

Uppgift 1 - 5 min

Vem/var/hur 1.1

Du har redan börjat fylla i er nuvarande affärsmodell och vill nu lägga lite, så första uppgiften börjar med att du vill lägga till att ni idag har *Företag* som **kund** och att *Hantverkskompetens* är en **viktig kompetens** för er. (...) Resten är redan ifyllt från att ni har påbörjat processen tidigare.

Overview 1.2

Du vill nu få en överblick över de svar ni har lagt in i dessa frågor så det kan du gå till nu. (...)

Visualisering 1.3

När du har läst dem vill du nu fortsätta med den nuvarande affärsmodellen. (...) Här ser du att affärsmodellen är visualiserad lite fel, ni monterar ju produkten in-house och skickar **sen** ut den till kunden och inte tvärtom. Ändra så att affärsmodellen visar det istället. (...)

Sammanfattning 1.4

Du vill sen kolla över så att **alla** svar från det här steget stämmer överens. (...)

Frågor - ca 7 min

- Hur upplevde du detta?
 - Vad kände du när du gjorde detta?
 - Varför/varför inte
- Hur säker är du att du gjort rätt 1-5
 - varför/varför inte
- Förstår du vad du har gjort?
 - Varför/varför inte
- Vad tycker du om sammanfattningen du har framför dig nu?
 - Förstår du den?
 - Stämmer den?
 - Litar du på den?
- Saknade du någon information i det du gjorde nu?
 - Varför/varför inte

Uppgift 2 - 5 min

Eftersom alla svar stämde för er nuvarande affärsmodell vill du nu gå vidare till nästa del av processen (...). Det har gått ett tag så här har dina kollegor redan påbörjat med att fylla i era strategiska förutsättningar, med resurser, aktörer och mål, som är klara. Däremot har ni inte valt strategi än utifrån detta, det ligger på ditt bord.

Info-ruta + läs mer 2.1

Andra uppgiften börjar därför med att du vill välja strategi, och först ta reda på

2.1.1 vem du (skulle pratat med) kan prata med för att få hjälp med det här (steget att välja strategi)

2.1.2 och sen hitta vad som krävs av strategin att *Reparera produkten* (...).

Jämför 2.2

Du är fortfarande inte helt säker än på vilken du vill att ni fortsätter med, så du vill se skillnaden på att *Minska resurser* och att *Reparera produkten* (...).

Välj strategi 2.3

Tillslut bestämmer du att ni ska fortsätta med *Reparera* (...)

Sammanfattning 2.4

och vill sen få en överblick över vad ni har valt och vad dina kollegor svarat i det här steget. (...)

Frågor - ca 7 min

- Hur upplevde du detta?
 - Vad kände du när du gjorde detta?
 - Hade du velat jämföra strategier på det sättet om du gjorde det själv?
 - Varför/varför inte
- Hur säker är du att du gjort rätt 1-5
 - varför/varför inte
- Förstår du vad du har gjort?
 - Varför/varför inte
- Vad tycker du om sammanfattningen du har framför dig nu?
 - Förstår du den?
 - Stämmer den?
 - Litar du på den?
- Saknade du någon information i det du gjorde nu?
 - Varför/varför inte

Uppgift 3 - 5 min

Nu har du utfört två av fyra steg i processen och under lite tid som går så gör dina kollegor det tredje steget, delegerar aktiviteter och väljer sätt att hantera returflöden, utifrån den strategi som du precis valde att fortsätta med.

CBMC 3.1

De har även påbörjat det fjärde och sista steget, men du vill gärna kolla på hur din nya affärsmodell ser ut nu utifrån det som är ifyllt innan den fastställs.

3.1.1 Gå till var du kan se detta

3.1.2 och läs där vilka **kunder** dina kollegor har fyllt i att ni har. (...)

Byta kundsegment 3.2

Du tycker att en kund ser fel ut, byt från *Offentlig sektor* till *Företagskund* (...).

Sammanfattning 3.3

Du vill sen se över hela affärsmodellen igen och fastställa den.

Frågor - ca 7 min

- Hur upplevde du detta?
 - Vad kände du när du gjorde detta?
 - Varför/varför inte
- Hur säker är du att du gjort rätt 1-5
 - varför/varför inte
- Förstår du vad du har gjort?
 - Varför/varför inte
- Vad tycker du om sammanfattningen du har framför dig nu?
 - Förstår du den?
 - Stämmer den?
 - Litar du på den?
- Saknade du någon information i det du gjorde nu?
 - Varför/varför inte

Nu har vi gått igenom alla uppgifter och har lite mer generella frågor om verktyget

Följdfrågor - ca 10 min

- Vad tycker du om verktyget?
 - Varför/Varför inte
- Förstår du det?
 - Varför/Varför inte
- Litar du på resultaten du fick av verktyget, om vi ponerar att det var du som hade skrivit in svaren?
 - Varför/Varför inte

- Tycker du att det hade hjälpt dig att använda verktyget om du hade velat utveckla er affärsmodell inom ert företag?
 - Varför/Varför inte
- Hade du använt det här verktyget?
 - Varför/Varför inte

Nu har vi egentligen ställt alla frågor vi ville ställa. Är det något mer du spontant tänker på eller känner att du vill få fram. Som sagt vill vi att det ska bli ett så bra och hjälpsamt verktyg som möjligt för att företag faktiskt ska vilja använda det, så alla tankar du har är bara hjälpsamma oavsett vad de är.

P

Evaluation after Interviews

Compared to 'Must Haves' and 'Should Haves' in Appendix Requirement and Guidelines after interviews and literature study

This appendix presents the ideation material from the second iteration's mindmapping session. The material is organized by interface section and step, following the structure of the tool. Requirements and guidelines are referenced by their ID number and description in English, as listed in Appendix Requirement and Guidelines after interviews and literature study. Solutions, design proposals and observations are presented in their original Swedish, as they were generated during the session. Three types of content appear throughout: Requirement and guideline references, listed by ID and description, indicating what each design proposal aimed to fulfill. Bold references are classified as Must Have, regular text as Should Have. Each requirement and guideline is marked with an arrow (→). Solutions generated during the initial mindmapping session, presented as bullet points, marked with (•) Additional solutions identified during the subsequent gap analysis, where unmet requirements were addressed, marked with (-) The MoSCoW prioritization of each referenced requirement is available in the consolidated requirements list in Appendix Requirement and Guidelines after interviews and literature study.

Overall

- Allt sparas automatiskt när ifyllt eller ändring gjorts
 - informera om det/feedback?
 - **24 Comply to process needing time to be realised (lätt att hoppa fram och tillbaka men fokus på ett steg i taget)**
 - **1,2 High usability (tydlighet)**
 - **1,31 Include low digital complexity (tydlighet, inte för komplexa navigationer eller digitala beslut, ej cluttered)**
 - 1,3 Support low digital maturity
- Ge överblick över respektive steg när det steget påbörjas för full förståelse av vad som komma skall
 - Detta ska alltid kunna nås när man har gått djupare in i steget
 - Kan klicka sig vidare utan att gå tillbaka till överblick
 - **1,2 High usability**
 - **1,31 Include low digital complexity**
 - 18,2 Show progression in development of CBM
- Tydlig återkoppling och sammanfattning med vad de gjort i varje steg och när de är klara med ett steg, samt vad som kom ut från det steget
- Tydlig feedback när använder verktyget, i små steg och stora
- **6 Offer guidance in the process of developing a new CBM**
- **35 Offer something the company cannot do without it**
 - samla info på ett ställe, möjliggöra att följa (andra punkter)
- **3 Ensure feeling of trust**
 - genom info och transparency som står massa under
 - genom 3,2: Include transparent and clear explanations
 - Behöver användarnas input
- **3,1 Show respect to the reality of the business**
 - genom att inte förenkla utan visa alla steg
 - lägga tyngd på viktiga grejer
- **4 Motivate its use and the transition**
 - genom design såsom markera vad verktyget tillför - “detta får du från verktyget”
 - ge allmän information
- 4,1 Motivate why circularity is necessary
 - ge information slagkraftigt
 - vad händer om man inte gör det
 - förklara varför varje steg är viktigt (ramverk steg 1-4)
- **4,2 Motivate the use of this tool**
 - genom design såsom markera vad verktyget tillför - “detta får du från verktyget”
 - bakgrund till verktyget, vad det är baserat på
- **6,2 Enable framework-following support (genom progress bar och överblick osv)**
- **18. Make process of CBM development easily followed (genom progress bar och överblick osv)**
- **21 Support SMEs**
 - designa och vikta utifrån SMEs förutsättningar
 - informera tydligt att det är för SMEs, och vi förstår deras problematik
- **24 Comply to process needing time to be realised**
 - ge tydlig information att det tar tid att övergå och ta fram CBM

- varför, ex prata med både interna och externa stakeholder
- designa för att inte stressa något steg
- ge varje steg mycket fokus
- 21,1 Comply to low frequency of joint meetings within the company
 - Inte kräva för mycket samarbete även om det uppmuntras
- 23 Demand little time of the company's everyday work
 - Inte vara tidsbegränsat utan öppet för dem när de vill/kan jobba med det
- 29 Ensure that the process is adjustable to their available resources
 - process att använda verktyget ska inte kräva mer tid, pengar, arbetskraft än vad de har
- **26 Bring an understanding why it's worth it for the business**
 - Inkludera vinst i form av ekonomisk, miljöavtryck och/eller kundvärde
- **33 Help increase knowledge of circularity within the company**
- **1 Be a digital tool**
- **1,2 High usability**
- **1,31 Include low digital complexity**
- **9 Include visual change feedback**
- 10 Adaptable to DPP's system
 - mer utvecklar-ansvar för att data ska kunna extraheras så att det matchar DPPs system?
 - Kan **Jonas excel** vara ett steg mot det? I de blå fälten?
- 40 Adaptable to different digital systems
 - Extraktionsmöjligheter att kunna översätta till andra system
 - 40,2 Adaptable to Office365
 - 40,21 Adaptable to Teams
 - 40,22 Adaptable to Excel
 - 40,23 Adaptable to Sharepoint

Home page

- Framsida/hemsida visar varje steg övergripande, där framtida steg är låsta
- möjliggöra info
- visa progress
- Visa tydligt var man i processen är, och visa visuellt att man kan gå mellan steg och tillbaka för att ändra, inte göra att allt känns så definit
- Ska det finnas en inloggsida eller hur ska den bli anpassad efter dem? Med info liknande första delen av **Jonas excel**?
- **3,3 Ensure feeling of trust for the new business model within the business**
 - Ge exempel från andra och hur de har gynnats
 - Förklara vad en övergång kan innebära och hur den kan se ut
 - [lex](#) att roller kanske försvinner men också omvandlas till nya roller istället
- 4,1 Motivate why circularity is necessary
 - information generellt
 - visuellt trycka på cirkularitet, “greenwasha” verktyget :)
- **26 Bring an understanding why it's worth it for the business**
 - exempel från andra och hur de har gynnats
 - ex karusell
 - generell statistik

→ **33,1 Increase knowledge about circular economy**

- faktasida om cirkulär ekonomi
 - learn more-flik
 - baseras på lit. study

→ **33,2 Increase knowledge about remanufacturing of furniture**

- tydligt informera vad som krävs och vad det innebär
- ev exempel från andras processer
- ev om alla BMs?

→ **25 Ge examples and inspiration of others' transitions**

- exempel från andra och hur de har gynnats
 - ex karusell

→ **36 Inform of the importance of marketing**

- informera att med rätt marketing är allt möjligt, kanske ökar trust att veta
- Kanske hur man kan göra eller hur andra har gjort det
- Kanske vad man bör fokusera på inom marketing (ex. vad som är viktigt för kunden)

Progress bar

- Över de fyra stegen
- kunna navigera genom
- kunna se vilka som inte fullt blivit svarade på
- Visa tydligt var man i processen är, och visa visuellt att man kan gå mellan steg och tillbaka för att ändra, inte göra att allt känns så definit
- **1,2 High usability**
- **1,31 Include low digital complexity**
- 18,2 Show progression in development of CBM

Mindre Progress bar

- För aktuella steget, utöver för hela steg 1-4
- Navigera
- Visa vad man svarat på och ej, visas på startsida
- **1,2 High usability**
- **1,31 Include low digital complexity**
- 18,2 Show progression in development of CBM

Information pane

- Alternativ:
 - Alltid synlig
 - behövs den alltid?
 - Popup
 - tar inte upp plats
 - får all info innan och detta är påminnelse
 - upp-poppad när öppnar första gången
- Info-innehåll

- vad frågan innebär
- varför svara på
- bra att tänka på
- exempel från andra
 - **25 Get examples and inspiration of others' transitions**
- vilka stakeholders att inkludera
 - **33 Help increase knowledge of circularity within the company**
 - 39 Enable understanding of which stakeholders need to be involved in transition
 - Ev. aktörslista
- Info om vad aktuellt steg är bra för
 - **26 Bring an understanding why it's worth it for the business**
- Info om relevanta stakeholders att prata med kring aktuella steget
- **3,2 Include transparent and clear explanations**
- **3 Ensure feeling of trust**
 - i info-ruta för steg 2-4
 - vad just det steget hjälper dem att komma framåt
- **21 Support SMEs**
 - skriv utifrån SMEs förutsättningar
 - lägga vikt på vi förstår deras problematik
- **25 Get examples and inspiration of others' transitions**
- **33 Help increase knowledge of circularity within the company**

Step 1

- **2. Base development process on four steps framework from CirkuTrä**
- **2,1 Initiate the development process with analysis of current business modell**
- **22 Development process should stem from the current business model**
 - Informera att det som läggs in kommer bidra till visualiseringen av nuvarande affärsmodellen i sammanfattningen efter steg 3
 - Separat få svara på frågorna om **VAD/HUR/VEM**
- **2.11 Enable analysis of current business model's actions through focus on the "what"s**
 - **2,111 Enable analysis of current business model's actions through what it is that they are doing**
 - **2,112 Enable analysis of current business model's actions through what needs they are fulfilling**
 - **2,113 Enable analysis of current business model's actions through what problems they are solving**
- **2,12 Enable analysis of current business model's action through focus on the "how"s**
 - **2,121 Enable analysis of current business model's action through how they are fulfilling the target groups needs**
 - **2,122 Enable analysis of current business model's action through howthey are solving the target group's problems**
 - **2,123 Enable analysis of current business model's action through what the most important activities are**
 - **2,124 Enable analysis of current business model's action through which competencies and resources are important**
- **2.13 Enable analysis of current business model's action through focus on the "who"s**
 - **2,131 Enable analysis of current business model's action through who their customer or target group is**
 - **2,132 Enable analysis of current business model's action through what needs and problems does the target group have**
 - **2,133 Enable analysis of current business model's action through How they reach the target group**
 - **2,134 Enable analysis of current business model's action through what collaborations they need in there business**
- **39 Enable understanding of which stakeholders need to be involved in transition**
 - **39,1 Enable understanding of which external stakeholders need to be involved in transition**
 - drop down för alternativ
 - fritext om behövs
 - fler svar möjliga
- **Sammanfattning**
 - tydligt vad/vilka svar som påverka kommande alternativ och vad de själva behöver ta hänsyn till
- Om de vill jämföra mer mellan ny och gammal (affärsmodell), släng in detta steg (ex. CO2-utsläpp) nuvarande värden
 - resultat

Design

Frågor under VAD/HUR/VEM

- Alternativ:
 - Visa en underfråga i taget
 - fokusera på en i taget
 - klicka in sig på en specifik fråga
 - (visa mer-knapp/info om för långt)
 - kan hoppa emellan frågor
 - (i hela steg 1)
 - (visa tydligt när man byter huvudfråga)
 - **svårare överblick**
 - Alla tre underfrågor samtidigt?
 - känns kanske stort att behöva svara på alla för att gå vidare
 - **lättare överblick**
- Antingen klicka sig igenom VAD/HUR/VEM-kort eller “börja”-knapp - båda två möjliga
- Kort byter färg eller visuellt visar att klara men klickbara, ej låsta.
- Vilka stakeholders man kan fråga
 - *eller under inforuta?*
- Lätt att spara och lämna utan problem
 - *sparas automatiskt?*

Sammanfattning

- Kort för **VAD/HUR/VEM** visuellt tydligt klara
- “AI-sammanfattning?”
 - av korten
- Tydligt skriva ut vad de sparas för, ex:
 - “Detta sparas för jämförelse”
 - “BMC”**→ 29,1 Enable action-oriented interaction related to entered data**
- “Sammanfattning i dessa”
 - Cirklar/kort
- Tydligt vad som påverkar kommande alternativ och vad de själva behöver ta hänsyn till
→ 29,1 Enable action-oriented interaction related to entered data

Steg 2

→ 2. Base development process on four steps framework from CirkuTrä

Resurs/kunder/mål

- Göra resurs/kunder/mål som i steg 1
- Ge sammanfattning av svar på resurs/kunder/mål
 - **2.21 Enable identifying of the company's available resources and waste**
 - **2,211 Enable identifying the company's available resources and scraps through if there are resources possible for better usage**
 - **2,212 Enable identifying of the company's available resources and scraps through if there are scraps to be used instead of discarded**
 - **2,22 Enable identifying of the company's customers and partners for the circular business model**
 - **2,221 Enable identifying of the company's customers through what circular needs and problems their customers have**
 - **2,222 Enable identifying of the company's partners through which partners/stakeholders have circular needs or problems that the company can solve**
 - **2,223 Enable identifying of the company's customers and partners through which partners/stakeholders can help the company solve the customers circular needs and problems**
 - **2,23 Enable identifying the company's circular goals**
 - **39 Enable understanding of which stakeholders need to be involved in transition**
 - **39,1 Enable understanding of which external stakeholders need to be involved in transition**

Val av strategi

- **2,2 Facilitate identifying of future circular strategy as a second step of the development process**
- Ge rekommenderad strategi utifrån resurs/kunder/mål
 - I “Läs mer” finns vad som krävs och vad de innebär
 - i “läs mer” om strategi finns checklista med vad de kräver som checkas i utifrån svar på resurs/kunder/mål
 - i “läs mer” finns exempel från hur andra gjort
 - **3,3 Ensure feeling of trust for the new business model within the business**
 - Tydligt informera om vad de olika alternativen kommer innebära, kräva och resultera i
 - **5 Enable understanding of the practical work of the new business model (tydligt vad som krävs och vad det kommer innebära)**
 - **5,3 Inform of needed logistics**
 - **25 Get examples and inspiration of others' transitions**
 - **7 Include connections to regulations relevant for the chosen strategy**
 - Informera om att det finns regelverk som är lämpliga att ha koll på
 - ev. ge exempel från den info vi har

- 7,1 Inform about relevant regulations regarding upcoming DPP
 - skriv ut information om hur DPP innebär och vad de bär tänka på för det
 - länka till EUs sida på DPP
- 7,2 Inform about relevant certificates (ISO, Möbelfakta , (Svanen, EU, Ecolabel), etc)
 - Om det finns
 - Informera om de regelverk som är lämpliga att ha koll på
- 11 Connect how the company's possibilities can increase customer value
 - Informera om vilka delar av strategi som ökar kundvärde i visa mer
- 11,1 Communicate environmental footprint of the new CBM
 - Informera om hur mycket footprint generellt minskar med de olika strategierna (i visa mer)
- 38 Highlight benefits and drawbacks of all strategies to choose from
 - Ha för- och nackdelar av de olika strategierna/bm osv i visa mer
- Rekommendation i % utifrån hur många boxar som är i-checkade
- Färgkoordinera så tydligt att det är reks?
- **2,24 Present alternatives of circular strategies**
- **29,1 Enable action-oriented interaction related to entered data**
- Kan välja mellan alla strategier, trots ej rekommenderade
 - Kan alltså också läsa mer om alla strategier
 - läs mer: vad innebär/kräver/exempel
 - [t.ex](#) remanufacturing workflows
- **3,3 Ensure feeling of trust for the new business model within the business**
 - Tydligt informera om vad de olika alternativen kommer innebära, kräva och resultera i
- **5 Enable understanding of the practical work of the new business model (tydligt vad som krävs och vad det kommer innebära)**
- **5,3 Inform of needed logistics**
- **5,5 Include support for remanufacturing workflows**
- **25 Get examples and inspiration of others' transitions**
- **33,2 Increase knowledge about remanufacturing of furniture**
- 7 Include connections to regulations relevant for the chosen strategy
 - Informera om att det finns regelverk som är lämpliga att ha koll på
 - ev. ge exempel från den info vi har
- 7,1 Inform about relevant regulations regarding upcoming DPP
 - skriv ut information om hur DPP innebär och vad de bär tänka på för det
 - länka till EUs sida på DPP
- 7,2 Inform about relevant certificates (ISO, Möbelfakta , (Svanen, EU, Ecolabel), etc)
 - Om det finns
 - Informera om de regelverk som är lämpliga att ha koll på
- Kunna jämföra två/flera strategier och deras innebörd/krav?
 - om tillräcklig info finns
 - genom att fästa?
- Visa tydligt vad deras svar från resurs/kunder/mål är, särskilt om ej rekommendationer är möjliga, så att de själva kan koppla grejer

- Kunna dra dera resurser/kunder/mål till strategier de tycker de kan kopplas/användas för? Om reks ej möjliga

Sammanfattningssida

- Ge sammanfattning av resurs/kunder/mål och av de val på strategi som gjorts
 - skriva ut praktiskt arbete som detta innebär/kräver och ev. exempel
- ➔ **3,3 Ensure feeling of trust for the new business model within the business**
 - Tydligt informera om vad de olika alternativen kommer innebära, kräva och resultera i
- ➔ **5 Enable understanding of the practical work of the new business model (tydligt vad som krävs och vad det kommer innebära)**
- ➔ **5,3 Inform of needed logistics**
- ➔ **5,5 Include support for remanufacturing workflows**
- ➔ **33,2 Increase knowledge about remanufacturing of furniture**

I info-ruta:

Val av strategi:

- Skillnad på strategi och affärsmodell
- I överblick av 10R står kortfattad info om varje R likt Powerpointen
 - ➔ **2,241 Visualise circular strategies (10R/3R framework)**

Step 3

→ 2. Base development process on four steps framework from CirkuTrä

- Ge alternativ på aktiviteter kopplade till vald strategi
 - kan läsa mer vad aktiviteterna innebär/kräver
 - **29,1 Enable action-oriented interaction related to entered data (val går in i senare steg)**
 - **3,3 Ensure feeling of trust for the new business model within the business**
 - Tydligt informera om vad de olika alternativen kommer innebära, kräva och resultera i
 - **5 Enable understanding of the practical work of the new business model (tydligt vad som krävs och vad det kommer innebära)**
 - **5,3 Inform of needed logistics**
 - **5,5 Include support for remanufacturing workflows**
 - **33,2 Increase knowledge about remanufacturing of furniture**
- **2,31 Enable identifying different circular activities based on circular strategies**
 - **7 Include connections to regulations relevant for the chosen strategy**
 - Informera om att det finns regelverk som är lämpliga att ha koll på
 - ev. ge exempel från den info vi har
 - **7,1 Inform about relevant regulations regarding upcoming DPP**
 - skriv ut information om hur DPP innebär och vad de bär tänka på för det
 - länka till EUs sida på DPP
 - **7,2 Inform about relevant certificates (ISO, Möbelfakta , (Svanen, EU, Ecolabel), etc)**
 - Om det finns
 - Informera om de regelverk som är lämpliga att ha koll på
 - **14 Highlight on where expenses can be minimised**
 - Olika aktiviteter kanske generellt kostar olika - visa det
 - Om det finns
- Väljer att göra själv eller delegera aktiviteter
 - om delegera - till vem - hur djupt till vem?
 - **2,32 Enable decision of circular activities**
 - kunna göra val av en eller flera som följer med till nästa steg
 - **2,321 Enable decision of distribution of activities to internal or external**
 - **39 Enable understanding of which stakeholders need to be involved in transition**
 - **39,1 Enable understanding of which external stakeholders need to be involved in transition**
 - **39,2 Enable understanding of which internal stakeholders need to be involved in transition**
- Om returflöden inkluderade i aktiviteter - ge alternativ på de olika returflödena
 - kan läsa mer om vad de innebär/kräver (inkl kostnader om tillgängligt)
 - inkl exempel
 - **2,322 Present alternatives of handling return flows**

- **29,1 Enable action-oriented interaction related to entered data (val går in i senare steg)**
- **3,3 Ensure feeling of trust for the new business model within the business**
 - Tydligt informera om vad de olika alternativen kommer innebära, kräva och resultera i
- **5 Enable understanding of the practical work of the new business model (tydligt vad som krävs och vad det kommer innebära)**
- **5,3 Inform of needed logistics**
- **5,5 Include support for remanufacturing workflows**
- **33,2 Increase knowledge about remanufacturing of furniture**
- **25 Get examples and inspiration of others' transitions**
- **39 Enable understanding of which stakeholders need to be involved in transition**
 - **39,1 Enable understanding of which external stakeholders need to be involved in transition**
 - **39,2 Enable understanding of which internal stakeholders need to be involved in transition**
- Ge alternativ på CBM (baserat på vald strategi?)
 - visa vad kräver/innebär
 - ge ev exempel från andra
- **2,3 Facilitate choice of circular business model as a third step of the development process**
- **2,33 Present alternatives of circular business models based on circular strategies**
- **29,1 Enable action-oriented interaction related to entered data (val går in i senare steg)**
- **3,3 Ensure feeling of trust for the new business model within the business**
 - Tydligt informera om vad de olika alternativen kommer innebära, kräva och resultera i
- **5 Enable understanding of the practical work of the new business model (tydligt vad som krävs och vad det kommer innebära)**
- **5,3 Inform of needed logistics**
- **5,4 Inform of needed manpower**
 - **39 Enable understanding of which stakeholders need to be involved in transition**
 - **39,2 Enable understanding of which internal stakeholders need to be involved in transition**
- **20 Help understanding of necessary action when growth in demand occurs**
 - Om CBM blir storskalig kommer istället denna logistik och arbetskraft behövas
- **5,5 Include support for remanufacturing workflows**
- **33,2 Increase knowledge about remanufacturing of furniture**
- **25 Get examples and inspiration of others' transitions ?**
- **7 Include connections to regulations relevant for the chosen strategy**
- **7,1 Inform about relevant regulations regarding upcoming DPP**
- **7,2 Inform about relevant certificates (ISO, Möbelfakta , (Svanen, EU, Ecolabel), etc)**
 - Om det finns
- **19 Encourage systematized production structure**
 - Vikt på att systematiserat hjälper för den aktuella CBM de kollar på

- Ge sammanfattning på vald strategi + CBM + vilka aktiviteter det innebär (inklusive returflöden)
- **3,3 Ensure feeling of trust for the new business model within the business (tydligt vad som krävs och vad det kommer innebära)**
- **5 Enable understanding of the practical work of the new business model (tydligt vad som krävs och vad det kommer innebära)**
- **5,5 Include support for remanufacturing workflows (om det blir det)**
- **33,2 Increase knowledge about remanufacturing of furniture (om det blir det)**

Design

Val av CBM?

- Antingen:
 - Ni har valt dessa strategier
 - *Ni har valt att*
 - => Ni kan välja mellan dessa (sållade) CBMs
- Eller:
 - Ni har valt dessa strategier
 - *Ni har valt dessa att*
 - => välj mellan alla dessa CBM
- Bara visa de sållade R, visa alla 10R i (i) [Lex](#).
 - **2,241 Visualise circular strategies (10R/3R framework)**
- Tydligt vilken strategi aktiviteten hör till
- **Fråga dem:**
 - “behov att se överblick över vad de valt?”
- Lista aktiviteterna under valda strategier
 - > klicka i om gör **själv/delar ut**
 - > fyll i vem som gör (om delegera) (drop-down/fritext? - hur djupt specificera?)
 - Om delar ur: Koppla till BMC, sen med partners

Sammanfattning när valt

- Här är er linjära BM (utifrån svar i steg 1 eller generisk)
- Här är era nya CBMs
- Dra CBMs (eller placera dem automatiskt?) där de platsar i nuvarande BM
 - + de aktiviteter de innebär under
 - Aktivitet här eller på rätt plats i cykel?
 - *(cirkulära affärsmodeller under egen rubrik under den linjära, eller läggs in/flyttas till rätt plats på/under/i den linjära affärsmodellen)*
- **34 Focus on adding an additional business model instead of a full switch**
- **12 Enable comparison between business models before and after transition**

Returflöde

- Om har RF (returflöde) som aktivitet
 - > få upp alternativ att välja mellan
 - ev på samma sida som aktivitet för att kunna hoppa mellan
- Om returflöden i strategi: välj på samma sätt

Steg 4

- **2. Base development process on four steps framework from CirkuTrä**
- **2,4 Enable concretisation of the company's new circular business model**

Beskriva kundsegmentet

- Lägga till kund
 - Fylla i de 5 olika kategorierna för varje kund (ex. vad för distinkt erbjudande de kräver och rättfärdigar)
 - drop-down förbestämt?
 - drop-down som skapas när de skriver?
 - Ev kort beskrivning i fritext för egen skull
 - Kunna sortera kunderna utefter kategorierna
 - de delas då upp i de olika svaren inom drop-downs
- **2,41 Enable concretisation of the company's customers or target groups**
- **2,411 Enable concretisation of the company's customers or target groups through who has similar needs**

Beskriva kostnader/intäkter

- Kolumner bredvid varandra för överblick
 - Totaler i botten (om summor ska skrivas i?)
 - total kostnad/intäkt/mellanskillnad
 - Beskrivning, om tex arbetskraft ska detaljeras?
- **2,42 Enable concretisation of the company's cost and revenues**
- **2,421 Enable concretisation of the company's cost through their manpower, material and components, manufacturing, waste management, service, transportation, administration and investments**
 - 39 Enable understanding of which stakeholders need to be involved in transition
 - 39,2 Enable understanding of which internal stakeholders need to be involved in transition
 - **2,422 Enable concretisation of the company's revenues by through their product sales, other product revenue, prive premiums, pay per use, premuneration and leasing**
 - **2,423 Enable concretisation of the company's revenues through their contracts**
- **26. Bring an understanding why it's worth it for the business**
- **26.1 Present economic effect of new business model to the company (om det är siffror?)**

Identifiera risker

- De 5 typerna av risker är synliga från första början för att tydliggöra att de bör försöka identifiera risker inom alla typer
 - inforuta som förklarar risktyp
 - inkl exempel
- Beskriv Risken

- Fyll i sannolikhet 1-5 och grad av konsekvens 1-5 -> få resultatsiffra + färgkod därefter
- Fyll i hur de ska hantera risken
- Risker samlas med färgkoder bredvid när ifyllda och tillagda?
- **25 Get examples and inspiration of others' transitions (i info om vad olika risktyper kan innebära t.ex)**

Vad/vem/hur

- Antingen som i steg 1
- Automatiskt ifyllt från tidigare svar
- Kan fylla på om något saknas
- eller så är det redan ifyllt efter att de svarat på frågorna hittills?
- **2,43 Enable concretisation of their new business model through focus on the "what"s**
 - **2,431 Enable concretisation of their new business model through what it is that they are doing**
 - **2,432 Enable analysis of their new business model through what needs they are fulfilling**
 - **2,433 Enable concretisation of their new business model through what problems they are solving**
- **2,44 Enable concretisation of their new business model through focus on the "how"s**
 - **2,441 Enable concretisation of their new business model through how they are fulfilling the target groups needs**
 - **2,442 Enable concretisation of their new business model through how they are solving the target group's problems**
 - **2,443 Enable concretisation of their new business model through what the most important activities are**
 - **2,444 Enable concretisation of their new business model through which competencies and resources are important**
- **2,45 Enable concretisation of their new business model through focus on the "who"s**
 - **2,451 Enable concretisation of their new business model through who their customer or target group is**
 - **2,452 Enable concretisation of their new business model through what circular needs and problems does the target group have**
 - **2,453 Enable concretisation of their new business model through how they reach the target group**
 - **2,454 Enable concretisation of their new business model through what collaborations they need in there business**
- **29,1 Enable action-oriented interaction related to entered data**
- **5,4 Inform of needed manpower**
 - **39 Enable understanding of which stakeholders need to be involved in transition**
 - **39,2 Enable understanding of which internal stakeholders need to be involved in transition**
- **20 Help understanding of necessary action when growth in demand occurs**
 - “Om CBM blir storskalig kommer istället denna logistik och arbetskraft behövas:”

CBMC

- Visa canvasen för igenkänningsfaktor om vi ska kalla den BMC
- Redan ifyllt utifrån svaren som angivits tidigare
- Kunna klicka sig in på respektive block

- Står tydligare var det ifyllda kommer ifrån
- Kan skriva i eget utöver det ifyllda
- Kan gå till steget som det ifyllda kommer ifrån för att se eller redigera
- **2,46 Enable collective concretisation of their new business model through a circular business model canvas**
 - **2,461 Include Add / Remove / Change operations (mutations) in the use of business model canvas**
 - Inkludera operationer från rapporten om digitala verktyg, på ett användarvänligt sätt
 - ◆ Include visual change feedback in business model canvas(add/change/remove)
- **29,1 Enable action-oriented interaction related to entered data (andra grejer påverkar denna, ändrar man grejer kommer det påverka annat)**
- **3,3 Ensure feeling of trust for the new business model within the business**
 - Tydligt informera om vad de olika alternativen kommer innebära, kräva och resultera i
- **5 Enable understanding of the practical work of the new business model (tydligt vad som krävs och vad det kommer innebära)**
- **39 Enable understanding of which stakeholders need to be involved in transition**
 - **39,1 Enable understanding of which external stakeholders need to be involved in transition**
 - **39,2 Enable understanding of which internal stakeholders need to be involved in transition**

Info-ruta

Risk

- Kritikalitetstalriskmatris som förklarar färg och siffra
- Informera att alla typer av risker bör undersökas

CBMC

- Förklaring av BMC
- **26. Bring an understanding why it's worth it for the business**
 - generellt men främst kring kostnad även att det inte är allt
 - kopplat till delen om kostnad: belysa att mer än pengar är det som är viktigt
- **11 Connect how the company's possibilities can increase customer value**
 - Informera om vilka delar av strategi som ökar kundvärde i visa mer

Sammanfattning när klar med affärsmodell

- Visa nya affärsmodellen
- **29,1 Enable action-oriented interaction related to entered data**
 - (den har formats av ifylld data)
- **3,3 Ensure feeling of trust for the new business model within the business**
 - tydligt informera vad som krävs och vad det kommer innebära för att fortsätta övergången
 - Få exempel
- **5 Enable understanding of the practical work of the new business model**
 - tydligt informera vad som krävs och vad det kommer innebära för att fortsätta övergången
- **5,3 Inform of needed logistics**
 - tydligt informera vad som krävs inom logistik och vad det kommer innebära för att fortsätta övergången
 - ev. placeholders för denna information
- **5,4 Inform of needed manpower**
 - 39 Enable understanding of which stakeholders need to be involved in transition
 - 39,2 Enable understanding of which internal stakeholders need to be involved in transition
 - tydligt informera vad som krävs inom arbetskraft och vad det kommer innebära för att fortsätta övergången för de olika stegen
 - ev. placeholders för denna information
- 20 Help understanding of necessary action when growth in demand occurs
 - “Om CBM blir storskalig kommer istället denna logistik och arbetskraft behövas.”
- **5,5 Include support for remanufacturing workflows**
 - om remanufacturing:
 - tydligt informera vad som krävs och vad det kommer innebära för att fortsätta övergången
 - Länka till andras remanufacturing processer eller var man kan hitta information om det
- **25 Get examples and inspiration of others' transitions (om de inte vet var de ska börja kanske?)**
 - ge exempel på andra som bytt till liknande affärsmodell
- **26 Bring an understanding why it's worth it for the business**
 - Kan man jämföra utsläpp från innan?
 - statistik från hur de har påverkat andras
 - deras kostnad och intäkter osv från steg 1-4
- **26,1 Present economic effect of new business model to the company**
 - deras kostnad och intäkter osv från steg 1-4
- 11 Connect how the company's possibilities can increase customer value
 - Informera om vilka delar av strategi som ökar kundvärde i
- 11,1 Communicate environmental footprint of the new CBM
 - Informera om hur mycket footprint generellt minskar med de olika strategierna
- 11,2 Help communicate results related to customer value
 - Presentera nytt footprint/billigare produkter eller liknande resultat som kan kopplas till customer value

- **34 Focus on adding an additional business model instead of a full switch**
- 12 Enable comparison between business models before and after transition
 - Visualisera gamla och nya, hur de kan kopplas ihop och hur de skiljer
 - 12,1 Highlight the changes from the transition
 - Som de också gör i **Jonas excel**, där fokus bör vara kopplat till vad de fyllt i i steg 1, vad de behöver jobba på
- 4,1 Motivate why circularity is necessary
 - jämförelse av nya och gamla affärsmodellen och vad man vinner på det
 - visa hur deras nuvarande (linjära) kan kombineras med de nya stegen (cirkulära affärsmodellen)
 - inkludera nya cirkulära steg i den linjära
- 7 Include connections to regulations relevant for the chosen strategy
 - Informera om att det finns regelverk som är lämpliga att ha koll på
 - ev. ge exempel från den info vi har
- 7,1 Inform about relevant regulations regarding upcoming DPP
 - skriv ut information om hur DPP innebär och vad de bör tänka på för det
 - länka till EUs sida på DPP
- 7,2 Inform about relevant certificates (ISO, Möbelfakta , (Svanen, EU, Ecolabel), etc)
 - Om det finns
 - Informera om de regelverk som är lämpliga att ha koll på
- 39 Enable understanding of which stakeholders need to be involved in transition
 - 39,1 Enable understanding of which external stakeholders need to be involved in transition
 - 39,2 Enable understanding of which internal stakeholders need to be involved in transition
 - tydligt informera vad som krävs inom arbetskraft och vad det kommer innebära för att fortsätta övergången för de olika stegen
 - ev. placeholders för denna information

Fortsatt användning när klar affärsmodell

- 5,1 Enable structuring of logistics depending on chosen strategy
 - skapar ett ramverk själva
 - 1. “ni har valt denna strategin”
 - 2. “det innebär denna logistiken”
 - 3. “ni har redan detta” - (fyll i själva)
 - 4. “ni behöver utöka med detta” - (fyll i själva)
 - 5. “såhär går logistiken till för en ny order” - (fyll i själva)
- 5,2 Enable structuring of manpower depending chosen strategy
 - skapar ett ramverk själva
 - 1. “ni har valt denna strategin”
 - 2. “det innebär denna arbetskraft”
 - 3. “ni har redan detta” - (fyll i själva)
 - 4. “ni behöver utöka/flytta med detta” - (fyll i själva)
 - 5. “dessa roller hanterar vad vid en ny order” - (fyll i själva)
- 12,3 Include alerts and guidance for high-priority actions for transitioning
 - 1. “dessa är stegen ni behöver jobba med för övergången”
 - 2. “dessa är de viktigaste stegen, i denna ordningen”
- 18.1 Include stepwise transition structure
 - Stegvis visa vad de behöver göra för att övergå
- 19 Encourage systematized production structure
 - Informera fördelar med att strukturera upp produktion
 - hjälps av 5,1 och 5,2
- 20 Help understanding of necessary action when growth in demand occurs
 - “Om CBM blir storskalig kommer istället *denna* logistik och arbetskraft behövas:”
- 36 Inform of the importance of marketing
 - informera att med rätt marketing är allt möjligt, kanske ökar trust att veta
 - Kanske hur man kan göra eller hur andra har gjort det
 - Kanske vad man bör fokusera på inom marketing (ex. vad som är viktigt för kunden)
- 39 Enable understanding of which stakeholders need to be involved in transition
 - Informera om vilka stakeholders som är delaktiga i de olika stegen och behöver inkluderas
 - “dessa kommer påverkas, dessa behöver inkluderas, kontakta dessa”
 - 39,1 Enable understanding of which external stakeholders need to be involved in transition
 - 39,2 Enable understanding of which internal stakeholders need to be involved in transition
- 40 Adaptable to different digital systems
 - Extraktionsmöjligheter att kunna översätta till andra system
 - 40,2 Adaptable to Office365
 - 40,21 Adaptable to Teams
 - 40,22 Adaptable to Excel
 - 40,23 Adaptable to Sharepoint

Q

Evaluation after Usability Tests

Compared to Must Haves and Should Haves in Appendix Requirement and Guidelines after Usability test This appendix presents the ideation material from the third iteration, following the usability tests. It documents design proposals addressing requirements and guidelines that were not sufficiently fulfilled in the initial high-fidelity prototype. Requirements and guidelines are referenced by their ID and description in English, as listed in Requirement and Guidelines after Usability test. Italic references indicate proposals that were ultimately not implemented. Each requirement is followed by design proposals marked with an arrow ($\rightarrow$). Observations and design proposals are presented in their original Swedish, as they were generated during the session, marked with (-).

General:

- Gör klart hela Steg 3
- Snygga till Progress barer
 - Gör karusell mer tydlig vart man är osv

Concrete from data:

- Kunna välja strategi direkt från lista
- Ta bort checkboxar och byt till bara checkar och ev överstruket
- Ändra från “affärsmodell” till “värdekedja” i redigerandet i steg 1
- Lägga till “okej” längst ner på första upp-poppande inforutan i varje steg
- Tydligare pilar mellan kort i Vad/Vem/Hur
- *ev. lägga till i kundsegment om kunden avser nyproduktion eller reparerad produkt*
- ev. Byta text till rullgardinsmeny när man väljer kund i kundsegment
 - Se över kategorier
 - Kunna lägga till egen kategori
- *Kunna jämföra mellan fler än 2 strategier*
- Ev ändra “Värdeerbjudande och målgrupp” till “Nulägesanalys”
- CBMC tydligare klickbar

From not fulfilled ‘Must Haves’:

- 1.2 High usability
 - Uppfylls av de konkreta vi fått ut
- 1.32 Clarity in interface
 - Uppfylls av de konkreta vi fått ut
- 1,321 Explain the usage of the tool
 - Ev introduction to the tool
 - Instruction pop-up available from button/clickable text
 - Placeholder for video
 - Include explanations of each task in information pop-up
- 1,322 Explain what is presented in the interface
 - Explain the elements and visuals on the interface
- 1,323 Offer clarity of where the user is in the interface
 - Tydligare progress bars + ev förklarande text
 - Carousel progress bar as well
- 1,324 Offer clear correlation between functions' design and their actions
 - 1,3241 Offer clear understanding of which are clickable elements
 - 1,3242 Offer clear understanding of which are unclickable elements
 - Correlated heaviness of functions to its actions, e.g. “Klar”-button
- 1,327 Offer consistency with automatic actions within the interface
 - se till att popup (och ev andra automatiska element) har utseende och funktion som återkommer i hela appen
- 1,328 Offer consistency in descriptions
 - Describe each task and information pop-up in similar way
- 3 Ensure feeling of trust

- 3,2 Include transparent and clear explanations
 - 3,31 Increase trust in the information regarding different strategies
 - More and clear information of strategies
 - Traceability of the information (source)
 - 3,4 Ensure feeling of trust in the tool
 - 3,41 Ensure trust for the chosen methods in the tool
 - 3,411 Explain the 10-R framework
 - Explain and defend the methods used in information pop-up
 - Traceability of the methods (source)
 - 3,42 Ensure feeling of being thoroughly revised
 - clear explanation of each step
- 5 Enable understanding of the practical work of the new business model
 - Information i steg 4
 - 5,3 *Include support for remanufacturing workflows*
 - 5,4 Inform of what the strategy would mean in practice
 - 5,41 Inform of what services they need to offer with each strategy
 - 5,42 Inform about logistics needed
 - 5,43 Inform of needed manpower
- 9,21 Differentiate clearly which BM is changeable and not, in step 1
 - Stronger difference between the two
- 18 Make process of CBM development easily followed
 - 18,3 Offer clarity in the understanding of the tasks within the process
 - Automatic information pop-up in every step, not only overview
 - 18,32 Offer clarity of what the results are based on
 - In text explain the results and what they're based on
 - 18,33 Offer understanding of how to execute the tasks
 - Explain with text how the tasks are executed
 - 18,34 Offer understanding of what type of answers are expected
 - 18,34 Offer deeper understanding of what the questions means
- 18,4 Enable foundational understanding of the process
- 21 Support SMEs
 - adapt to low digital maturity and small businesses with less resources, information and layout
- 24 Comply to process needing time to be realised
 - information och tydligt gränssnitt överallt att det går att (och ska) inte fylla i allt på en gång, det sparas och de kan komma tillbaks
- 26 Bring an understanding why it's worth it for the business
 - 26,1 Present economic effect of new business model to the company
- In big summary and in information of strategies
- 44 Inform where the entered information is saved and how you reach it
 - ha med i alla steg
- 46,1 State clear differences between strategies
 - Utöver Jämför skriva något mer om det, skriva tydligare om 10R?
 - Jämförbara parametrar
- 48,1 Enable changing the visualisation of the current business model through multiple actions
 - 48,11 Enable drag and drop-function to move blocks
 - 48,14 Enable copying blocks

From not fulfilled 'Should Haves':

- 1,3 Support low digital maturity
 - Fulfilled through 1,32 osv in Must haves
- 3,312 Include information of the aim and gains of the strategies
 - lägg till på sidan för Strategier (i drop down, eller info?)
- 3,412 Explain what the pre-named topics and alternatives mean
 - In info-pop-up
- 4,1 Motivate why circularity is necessary
 - Include in facts section
 - Include in steps?
- 5,1 Enable structuring of logistics depending on chosen strategy
 - Få med i Big summary (ev även på strategi-sida)
- 5,2 Enable structuring of manpower depending chosen strategy
 - Få med i Big summary (ev även på strategi-sida)
- 7 Include information about regulations
 - In its own column
 - In strategi information
 - In big summary
 - 7,1 Include connections to regulations relevant for the chosen strategy
 - 7,11 Inform about relevant regulations regarding upcoming DPP
 - 7,12 Inform about relevant certificates (ISO, Möbelfakta , (Svanen, EU, Ecolabel), etc)
 - 7,2 Include information about regulations when choosing between strategies
 - In strategi information
 - 7,3 Include information about regulations when in the summary
 - 7.4 Enclose information about regulations in its own space in the interface
 - In its own column
- 9 Include visual elements throughout the tool
 - se över vart fler visuella element kan läggas till som gör det tydligare, och matchar resten av appen
 - Include visual change feedback in business model canvas(add/change/remove)
 - tydligt att, och var, man kan klicka, ändra i CBMCn
- 11 Connect how the company's possibilities can increase customer value
 - 11,1 Communicate environmental footprint of the new CBM
 - In summary 2
 - In big summary
 - 11,12 Inform about improved carbon footprint when choosing between strategies
 - In strategy information
 - 11,2 Help communicate results related to customer value
 - In big summary
 - Clear gains that they could use in communication to user
- 12 Include next step of process of transition
 - 12,13 Include alerts and guidance for high-priority actions for transitioning
 - Tydligt få med i text i Big summary
- 14 Highlight on where expenses can be minimised
 - i sammanfattning för Steg 4 informera efter deras siffror

- 16,21 Include use of workshop to execute the tasks
 - In information pop-up
 - give examples on how they can do this task through workshops
- 18,1 Include stepwise transition structure
 - Big summary
- 20 Help understanding of necessary action when growth in demand occurs
 - Få med i Big summary
- 36 Inform of the importance of marketing
 - Big summary
- 38 Highlight benefits and drawbacks of all strategies to choose from
 - Få med på Strategi-sidan för varje strategi
- 39 Enable understanding of which stakeholders need to be involved in transition
 - In strategy information
 - In big summary
 - 39,1 Enable understanding of which external stakeholders need to be involved in transition
 - 39,3 Enable understanding of which internal stakeholders need to be involved in transition
- 41 Inform of multiple ways of thinking and doing the tasks
 - få med i info för alla steg
 - 41,1 Inform of what the cost/revenue should cover
 - information högst upp på sidan för Cost/revenue
- 42 Include source of information
 - In strategy information
 - In return flow information
 - In fact segments in home page and big summary
 - 42,1 Include source of why the strategy is worth it
- 43,1 Enable choosing strategy directly from the list
 - Instead of where the symbol is, add a checkbox or similar?
- 43,3 Enable confirming automatic pop-up to close
 - add “okej” button to the info-pop up when it is automatically opened
- 50 Enable prioritisation of the available strategies
 - få in prioritering direkt på sidan tydligare, och kunna välja lite själv
 - 50,2 *Enable visual deprioritize irrelevant strategies*
 - 50,3 *Enable visual prioritisation among strategies*

R

Compilation of Answers in Usability Tests

This appendix presents a compilation of observations, participant reflections, and responses gathered during the three usability tests conducted in the Usability Phase. Participant contributions are identified by their participant number (P3, P4, P5). Comments and expressions from the participants are marked with (-), actions are marked with square brackets, and interviewer comments are marked with (L:). The scripts are kept in their original Swedish, as they were used during the sessions.

Task 1

P5:

- Ny kund va?

[trycker på vem]

[kommer tillbaka]

[trycker på vem]

[kommer inte vidare från "Vad gör vi?"]

- Jag tänkte eftersom Vem är kunden att jag trycker där.

[L hjälper till med att gå till höger]

- Ja men nu fattar jag
- Jag såg den, men var inte riktigt med på. Den var lite liten helt enkelt.
- Vad sa ni mer, ny kund tänkte jag var här

[La till ny kund]

- Här skulle jag lagt till kompetens antar jag
- Var det första?

[överblick över svaren som ni lagt till - nu på fel ställe av]

[nuvarande affärsmodellen]

[L: tryck på fortsätt]

[trycker på logistik]

- Egentligen tänkte jag dra den så
- Om inte det gick, tänkte jag ta bort och lägga till fär
- Bästa med drag and drop funktion
- Eller till och med copy - vi har bara in och ut
- Högerdra - drag and drop egentligen bra - har ni tänkt på det
- Med lådor tycker jag det är logiskt
- Vilken jag jobbar med och inte jobbar med, läser inte alla ord så vill ha grafiskt
- Minska ner eller byt färg så den ser annorlunda ut, tänker jag

[L: kan flytta steg]

- Juste. Det är en bra funktion så, men jag vill ha drag and drop också faktiskt - kanske högst personligt
- Varför kunde jag inte spara förrän nu?

[lina förklarar om stadie osv]

- Står i inforuta [uppklickad]

[kolla så alla svar stämmer överens]

- På affärsmodellen?
- [går till sammanfattning i]
- Bra med visualisering där
- Måste den vara linjär från början? Helt linjär?
- *[L: vi har utgått från exempel. genererat från vad man svarat]*
- Vi har komponenttillverkning och har vi även [andra steg]. kan vara mer komplex
- Lite dynamisk och man kan bygga vångar. det är bra

P4:

- Då stänger jag den då? [inforuta på Nuvarande affärsmodell]
- Ska jag klicka på den här, "gå till"?
- Tillverka möbler, ja...

[L: företag som kund]

- Jag trycker +:et då eller hur tänker nu?

[L: olika, kort är olika. testa att gå höger och vänster]

- den här är lite ifylld, ska vi låta vara eller redigera?
- mitt nästa är att jag klickar framåt?

[L: ja precis. lägg till kund som företag]

- Vart gör jag det då? längre fram?

[klickar fram några steg]

[ändra privat kund]

- Ska jag lägga till då?

[trycker + under kund]

- Så?
- Och sen framåt?
- Och på vilket gör jag det [kompetens]

[klickar fram]

- Aktiviteterna, ehm?
- Vad tänker ni att hanverkskomentens är här då? [kompetenser]

[lägger till]

[L: överblicken]

- Vart gör jag det? Nästa?

[L: hur vill du ha det?]

[lägger till fler kompetenser]

- När man är färdig trycker man kanske nästa och så är den där?

[trycker nästa efter vi sagt att han kan testa]

[L: svaren har genererat en affärsmodell, som du ser framför dig. men den är lite fel]

- Ah, då klickar man Gör ändringar?

[klickar på Gör ändringar]

- Helst hade man bara velat kunnat dra den

[L: nej inte nu]

[klickar runt]

- Jag förstår inte hur jag ska ändra. jag skulle flytta Montering innan logistik
- Trycker jag på +, eller redigera-knappen

[trycker på penna]

- Tar jag bort den?

[stänger och öppnar igen]

- Flytta steg står det iofs

[trycker på pil]

- Flytta steg hade jag gärna velat att den hamnar emellan
- Jaha, nå förlåt. det var bra som det är gjort.
- Jag klickar på Spara ändringar här då

[L: ber flytta steg till]

[sparar]

- Jag har synpunkt. det som modellen beskriver kallar jag värdekedja och inte affärsmodell

[L: överblick på alla svar. gå dit.]

- Jag trycker nästa då. här har vi sammanfattning då - värdekedja ich Vad, vem hur

P3:

- och det här är, när man loggar, är detta landningssida? [info]

[L: tryck på r - där är landningssida]

- nu ska jag läsa igenom för att komplettera med uppgifter?
- då läser jag lite innantill i mitt huvud [scrollar på Startside ett tag ca 1 min]

[klickar på Nuvarande affärsmodell och läser inforuta, klickar ner på x]

[läser]

[klickar Vem]

[+ på Vad gör vi]

- Nej, det var vad vi gör här

[klickar vidare till Vem är kunden]

[Pil ner på privat kund x3]

[klickar + och lägger till Företag]

[försöker skriva i]

[försöker klicka vidare till kompetens]

[missar ">" knapp, trycker på fortsatt istället]

[L: allt är svarat på på förra]

[bläddrar sammanfattning och läser]

[L: när du läst igenom > nuvarande affärsmodell, se den visualiserad]

- Nu hoppade jag kompetens va? [L: ja precis]

[klickar nästa]

[L: du inser att den är fel]

[Läser]

[Klickar Gör ändringar]

[Klickar + mellan logistik och montering]

[trycker på penna i montering]

- Här tänkte jag att man skulle dra eller trycka någonstans
- Nä, här körde jag fast. jag vill ju trycka och flytta

[trycker på logistik]

- Jaha, nu här kunde jag det

[flyttar steg en gång, försöker spara]

[L: flytta ett steg till]

- Jaha, nu fattar jag.

[Nästa]

[L: första uppgift klar]

Questions task 1

- Hur upplevde du detta?
 - Vad kände du när du gjorde detta?
 - Varför/varför inte

P5:

- Lite luddigt när man var här [Er nuvarande affärsmodell]
- Det fanns en info iofs. Inte jätteintuivt vad som var var, men kan vara så att jag inte läste. Så skit i det.
- Är kundgrupp mer mindre företag? [L: *ja precis*]. Jag fattar, för det kan ju vara lite svårt spontant men kanske finns mer info också, att lägga nivån. Men det kanske finns förklarat här [inforutor]
- Jag kommer in mitt i case, som gör det småluddigt. Vilken avgränsning ska man göra här för att få bäst nytta av verktyget. Ganska bra info om det, vilken huvudkunder, vad är er huvudverksamhet och inte snöa in på detaljer. Någon into om så man fattar hur mycket info man ska skriva in, så man får ut något av det. "Hej och välkommen" eller video eller likande

P4:

- Det var ju första gången, så vi får ja men jag har inte riktigt överblick, eller helhetssyn ännu för detta

P3:

- Kan jag gå tillbaka till hur det såg ut innan? för att få uppfattning
- Nu gick vi in i den här rutan Vad/Vem hur, och det var det som fylldes i under?
- Först hängde jag nog inte med när jag hoppade emellan. Vad vi gör, här hade jag önskat en beskrivande text under Vad gör vi och kanske under den texten med instruktioner med vad ni gör, ni kan lägga till fler kompetenser eller rader och det står i att i nästa steg får du beskriva detta.
- Den här strecken här nere, ska det symbolisera rutorna här uppe? [L: *en karusell då*]. Ja, juste. Och sen går den om igen då. då hade jag önskat att det stod detta är ruta 1 av 12, eller 2 av 12. så att jag vet och inte fyller i samma info igen.
- Affärsmodellen - nä men egentligen samma, det är tydligt så. Kanske för den här är egentligen schematisk uppställning om hur det ser ut - jaha det blev automatiskt utplockat från föregående. Då är det kanske samma sak här då, göra det mer tydligt att det här är en schematisk som du kan ändra. Knappen är tydlig. Nästa kanske tydligare test, vill du lägga till element, byta så kan du trycka plus, eller på den eller slidar osv. Annars tycker jag det var bra
- Information är alltid bra att ha lättillgänglig, men kanske att man gör i:et mer förklarande men under Er nuvarande skriva detta är detta och gör detta och under i:et mer förklarande. för om vi tänker att den ska gå ut i verksamhet är det många som inte är vana att jobba med denna skolexempel presentationer, bättre övertydlig.

- Hur säker är du att du gjort rätt 1-5
 - varför/varför inte

P5:

- Ganska ändå, nu när jag väl fattade
- Var väl lite med att flytta - men när du hjälp gick det bra
- Så rätt lätt
- Totalt 3
 - Flyttandet kanske svårt. men också kom in mitt i och inte alla knappar funkar. Annars 4, tror jag.

P4:

- Asså det kände jag mig inte så säker på riktigt. svårt att säga, jag känner mig för mycket nybörjare för att uttala mig
- Då säger jag en 2a för att säga något
- Mer säker: så svårt att säga med. det var ju förifyllt, när ska jag fylla i och vad är förifyllt. Jag tror det är främst där. Sen hade jag problem att fylla i värdekedjan, men när jag väl förstod var det ju väldigt elegant
- Det hade varit bättre för mig [att fylla i från början]. för min förståelse hade det varit bättre
- Det är inte så att jag har en bättre idé

P3:

- Ja men om vi säger så här. under första moment, tycker jag jag bara på för jag nte riktigt förstod vad jag tryckte på. medans under summering mer tydligt. Detta är ju första sidan inna man fyllt i, sen fylldes det ju in längst ner under sammanfattning på Översikt. Förklara under sammanfattning, ha text vad det är och att du kan ändra.
- Förstår du vad du har gjort?
 - Varför/varför inte

P4:

- Man kan väl säga, det är ingen[?] form av analys av en nulägesanalys skulle jag kalla det
- Vad tycker du om sammanfattningen du har framför dig nu?
 - Förstår du den?

P5:

- Jag tyckte den, nu har jag fyllt i allt, det är en granskningsfrunkion. det tyckte jag. men förklaring på vilka formerna är.

P3:

- Ja, absolut. Så det är mer som innan. Här får man ju sammanfattning av svar och affärsmodell.

- Stämmer den?
- Litar du på den?
- Saknade du någon information i det du gjorde nu?
 - Varför/varför inte

P4:

- Man kan säga, det som är här är en linjär värdekedja eller affärsmodell. jag säger bara något, ibland gå in mer på, splitta upp värdekedja i flera steg, gå djupare

Task 2

P5:

- Bättre när den poppar upp [inforuta] men det kanske den gjorde innan med, kommer inte ihåg [till välj strategi] *[L: vilka involvera]*
 - Är det det jag vill göra?
- [klickar på info + x-knapp]
- Inte riktig med på, vem prata med?
- [L hjälper tillbaka till info och aktörer, ska något vara tydligare för det?]*
- Jag tror inte jag förstår frågan.
- [L: efter detta, vad som krävs]*
- [trycker på jämför på reparera]
- [L: jämför med minska]*
- Jag vet nog inte vilka du menar. återvinna
- [klickar på återvinna]
- [L: den som heter minska]*
- [klickar på minska]
- Är det R-strategierna det här?
 - I mitt huvud är återtillverka och minska
- [L: välj reparera]*
- [väljer reparera och trycker på nästa]

P4:

- [L: nästa steg]*
- [klickar fortsatt]
- Är det fortsatt då?
 - Jag kan läsa igenom det här snabbt [inforuta]
- [gått tid, kollegor fyllt i osv. välj strategi och vem prata med i steg]
- Jag klickar på Val av strategi då [klickar]
- [står still på sidan länge]
- [L: vem prata med för att få hjälp]*
- Ofta, denna typ av frågeställning, är det bra att göra i projektgrupp - olika kompetenser, försäljning, produktion, produktutveckling
- [L: någonstans på skärmen?]*
- jag har svårt att se det på skärmen, står ju Jämför kunde ju vart kontakt.

[L: kolla på vad som krävs för reparera istället]

- Här nere då [trycker på pilen]
- Här dök det upp mycket mer då

[L: du läser, inte helt säker och vill jämföra dem två]

[Läser länge på Reparera fortfarande]

[Trycker ner]

[Klicka ner pilen Minska - men gränssnitt inte gjort för det]

[L: kan du göra på något annat sätt?]

[klickar runt en massa]

[trycker på Jämför på reparera och läser till höger]

[klickar ner]

- jag har väl klickat på dem jag kommer åt

[L: det finns ett till sätt, klicka Jämför på båda]

- då dyker dem upp bägge två där då

[L: du har jämför och beslutar med reparera. välj reparera och gå vidare]

[tar bort jämför]

- Jag hade velat klicka på första här. Att klicka på handen hade vart logiskt för att välja

[scrollar ner, men gör inget]

- Jaha, jag har ju en här

[väljer Reparera i drop down]

- Jag hade egentligen velat välja direkt från listan

[klickar till sammanfattningen]

[L: vad ni svarat tidigare, om du scrollar ner osv.]

P3:

- Då är frågan om det är fortsatt eller hem. jag väljer fortsatt då

[trycker fortsatt]

[läser inforuta]

[läser Översikt 2]

- Ja, då känner jag ju igen layout hur det är upplagt då jag fattar att jag kan gå in i det de redan har gjort. så jag går hit [klickar fjärde rutan]
- Tidigare svar, vad kan det där betyda [klickar upp]

[läser sidan]

[klickar pil ner för Återbruka (går ej - Figma)]

- Okej då ser jag olika nivåer på hur man kan resonera kring en cirkulär produkt, eller modell och eftersom jag är litet företag vill jag inte Avstå och likaså en tjänst, kanske man göra till viss mån, [...] kanske är mer intressant. mer reparationservice för våra kunder.

[L: läsa mer om reparera]

[klickar jämför på repara och läser]

[L: du vill ser skillnad]

[klickar jämför på minska]

- Jaha, då kommer de upp brevid varandra där.

[klickar en till jämför (går ej Figma)]

[L: fortsatt med reparera]

- Jag tänkte här, det är ingen förklaring vad procenten betyder. Kan vara rubrik för vad är det jag tittar på? [L: vet du vad det kan vara?] det har ju med hur mycket nya resurser som måste tillföras gissar jag, eller det kan det inte vara. Nej jag vet nog inte

[väljer reparera och går vidare]

Questions task 2

- Hur upplevde du detta?
 - Vad kände du när du gjorde detta?

P5:

- Mer att jag inte förstod uppgiften än verktyget
- Jämförelsen var tydlig
- Var de generiska, jag har inte sett dem på svenska innan. när du sa minska resurser var jag mer inne på repurpose eller remanufacture så det var nog därför jag var ute och seglar. sen var väl denna var bättre
- Den här tycker jag också var tydligt [drop downen]
- Man kanske vill kunna välja mer än en strategi? [L: *man gör en i taget, så kan man i nästa göra flera också*]
- Okej, det är bra om det framgår då. För vi gör [flera av dem], 6-7 av dem.
- Står om vilken som är mest prio, och kanske tom om det är någon du inte vill jobba med. Gradering av dem. Jag är insnöat på vårt, men flera strategier samtidigt. Så bara en är lite smal kanske spontant.

P4:

- Det tar lite tid innan man har förstått det hela tycker jag
- lite, det jag kan säga där var framförallt jag hade velat trycka på den raden för att välja [direkt i listan]
- [L: *jämföra var det hjälpsamt?*] Jag fattade ju inte att det var så det var tänkt, så mer att jag inte förstod det
- Sen minska, och jämför jag tycker snarare att det inte är att välja det ena eller andra utan man ska välja allt i rätt riktning. Jag hade velat välja flera strategier
- Jag tycker att man vill välja ut att dessa är rimliga för mig, och sedan välja ut de viktigaste och de andra är med vad som är bra senare. Nästa prioritetsordning som man betar av en efter en

[L: *Procent, förstod du den?*]:

- Nej. om jag säger snabbt gissar jag på prioritering eller mest värde för produkten då, mest hållbart, hur stor/viktig punkten är.
 - Hade du velat jämföra strategier på det sättet om du gjorde det själv?
- Jag tyckte nog det var bra.
- Man kanske vilja kunna lägga fem på rad. då kan man känna att [...] den kan vi ju inte lösa så den får vi skita i. Så kan man göra en kartläggning, svårighetsgradsanalys, SWOT.
- Flera för överblick
- Stryka eller ta bort den man inte vill.
- Dynamiskt att vänstra rutan minskar - ja men det gör den ju fint.

[L: kan du tänka dig vad procent står för]

- Inte hur mycket man sparar, utan snarare tvärtom ju. det känns som att om du avstår släpper du ut [...] till skillnad mot annan med släpper ut 90%

[L: hur mycket man matchar med den strategin, hint vilken man matchar mest med]

[L: om du trycker ner rutan, och ser checkboxar, där är hur mycket det matchar]

- har jag fyllt i dem [L: nej, känns det hjälpsamt].
- Ja, men med text eller inforuta eller hovrar. jag tänkte på det, men trodde miljöbesparing. men smart tycker jag. eftersom jag inte vart med från början lite knepigt. men tydligare annars kanske
 - Varför/varför inte
- Det var inte solklart, nu har jag ju varit med i RE:Furn så känner igen sättet. jag har jobbat med möbler länge, då var mycket av detta nytt innan. behöver nog mer förklaring - vad är man på jakt efter, syfte med dem och vad som skiljer åt och vilken vinning med det ena eller andra.
- Nu valde vi en, en arbetsmodell kan innehålla flera nivåer. reparation, renovering och upprustnings, som i detta fall ringar i en flera stycken. Bara det kan göra att man blir förvirrad, är det detta eller det andra vi erbjuder?

- Hur säker är du att du gjort rätt 1-5

- varför/varför inte
- 2a då kanske för att det var hackigt
- sista var jag med på, men att jag inte fatta uppgift men lite vad är det jag vill. jag har inte lyckats sätta mig in i det.
- Men inget tydligt i verktyget [som jag konstigt]
- Inte när jag var där men efter jag har gjort förstod jag bättre
- Svårt att gradera, jag säger en 3a för att säga något
- Inte 100. kanske kopplat till att jag inte vet, nu valde vi repara. Jag kanske inte förstod vad innebörden av vad jag valde var. men vi har inte heller kollat sammanfattningen här nere.
- Förståelse för vad man gör är viktig, och kanske då ja men lite mer beskrivande. genom att gå denna väg inom cirkulär innebär det att ni erbjuder mer den här tjänster. Mer kött på benen så förstå man nog det mesta bättre

- Förstår du vad du har gjort?

- Varför/varför inte

- Vad tycker du om sammanfattningen du har framför dig nu?

- Förstår du den?
- Stämmer den?
- Litar du på den?

P3:

- Om vi ser till den som ska använda den som sagt, är möbelformgivare för att tänka nytt, då innebär egentligen - benämningen av Reparation innebär, men den kanske egentligen ska riktas mer från användarens perspektiv att med detta val skall du erbjuda dina kunder att bla bla bla. annars fattar jag att ni har ringat in vad benämningen betyder. men som affärsområde är att hur vi ska göra.

- Ska man klicka i Kräver, eller är det något som man får? [L: *de fylls i*]. Jag tänker att reparation innebär egentligen att laga saker då om jag förstår rätt? För det är kanske detta som inte är tydligt, vad skillnaden är på renovering och reparation. Om vi ska erbjuda att hjälpa kunder med en gammal stol, för kunden visar de bild och vill ha hjälp. Men för företag kan det vara olika, men för mig är det samma sak men olika ingrepp. då är mycket leverantörer ofta inblandade [L: *det är en tanke vad som behövs som man inte har*]
- Reklamation förstår jag inte vad det syftar på. är det att man får en reklamerad vara? [L: *detta är bara exempel*]
- Saknade du någon information i det du gjorde nu?
 - Varför/varför inte

P5:

[L: *något mer att läsa om eller se mer om i de 3 strategierna?*]

- Lite tänker jag att man - är dessa möjliga att justera eller fasta? [sammanfattning]
- [fasta] jag tolkar dem som ifyllningsbara
- Antingen kunna bocka i själv, för v produktflora är det här viktigt - jag vet inte om det är en rimlig tanke
- Kan vara en designfråga, så man fattar att man inte kan justera
- Aktörer kanske är - en stor del frö oss är externa krav - kanske lagt en specifik lag-kolumn och inte under aktörer. lagkrav, intressentkrav sov som egen kolumn - vi jobbar mycket med det och utifrån det. [...] så man har det med sig. Är viktigt steg att man har det med sig.

P4:

- Om jag ska säga något, den funktionen att jämföra är svår att, har du väl förstått att den finns, innan du förstår att det är möjligt tror jag är svårt
- Man kanske behöver få det förklarat då?

[L: *i varje steg finns det en info.*]

- I grund och botten - punkt att ta med in i strategi eller inte, och utöver prio om störst effekt. Det är de viktigaste punkterna tycker jag

Task 3

P5:

[trycker in på 4 och läser info + x]

- Jag hade inte velat kryssa den - vill ha okej istället.
- Överblick sa du?
- Jag ska bara sätta mig in i vad mina kollegor svarat, vara en bättre student [läser sammanfattning på Överblick]

[klickar på sammanfattning]

[L: *när du läste såg du OS (offentlig sektor), vill ha företagskund ist*]

[klickar sig tillbaks men kan inte trycka in i OS för Figma hade fel]

[L *ber klicka på kundsegment*]

[nu trycker i "f" i den rutan för OS]

[trycker nästa]

[går tillbaks]

[går till sammanfattning]

[läser info på sammanfattning]

[trycker på klar]

P4:

[trycker hem]

[klickar till steg på 4e]

[läser info, trycker x]

[L: du vill se hela affärsmodellen innan fastställs]

[bläddrar ner i sammanfattning på översikt]

- Ja och hur går jag vidare här, eller vill ni att jag kommenterar?

[L: förklara gärna]

- Spontant vill se visuell bild av affärsmodellen i detta läge

[L: inte sammanfattning än, utan översikt. korten är redan besvarade, så gå till sista kortet]

[trycker där]

- Den här tycker jag var väldigt elegant [BMC]

[L: se vad det är för kunder de fyllt i, ser att OS är fel - vill ändra]

[trycker på kundsegment och gå till kundsegment]

- Jag vill klicka på minustecknet så den försvann

[L: det kan man göra men inte nu]

[klickar i OS]

- För övrigt vet jag inte hur man ändrar eller får bort den]

[L: testa skriv in "f"]

[skriver in "f"]

- Jag hade velat ha som rullgardinsmeny som tidigare istället]

[tror du de finns så tydliga att det går med rullgardin]

- I vår värld, företagskund, OS, återförsäljare eller projektbolag - inte många kategorier
- I något läge kan man tänka att om den ser ny produkt eller reparation. En aspekt, var den hör hemma vet jag inte

[L: se över hela affärsmodellen]

- Översikt eller?

[klickar Nästa]

- Här form av kostnader då.

[klickar Nästa]

[klickar Nästa]

- Sammanfattning då, och då har de uppgraderats då [företag]

- Då trycker jag klar då antar jag [klickar]

[scrollar]

P3:

[klickar fortsatt]

- jag provar hem då [klickar]

[klickar till steg]

- Då ska vi se Kunder [läser under]

[läser sammanfattning på Översikt]

[klickar CBMC]

[L: här vill du ändra OS till företag]

[klicka kundsegment och ändra]

[klickar privat och skriver f (problem med figma)]

[funkar sen]

- Är beräknar per order eller set up - prisberäkning?

[L: vi har diskuterat med Mirka efter vad de har gjort, kan vara order]

[L: fastställ]

- Då är det Klar gissar jag?

[Klar]

Questions task 3

- Hur upplevde du detta?
 - Egentligen rätt bra att kunna gå den vägen
 - Inte tydligt att den var klickbar, trodde det var en illustration som inte var klickbar
 - Min väg hade funkad i verkligheten? [L:ja]. bra att man kan ta olika vägar
 - Vad gjorde jag innan?
 - Lite tydligare i design att den är klickbar, jag get inte hur. Men annars såg det bra ut.
 - Bra med denna [bild på sammanfattning CBM] och en uppdatering affärskedja
 - Sista uppgiften kändes klart bäst
 - Jag tycker att den här, jag fick helhetssynen via BMC och sen trevligt med den här nu med ett förändrat flöde [CBM]
 - Vet inte om möjligt, önskar mer visuellt - göra dem här sakerna och har en visuell bild hela tiden som visade vad man höll på med. Mm hela presentation hade kunnat utgå från visuellt flöde hade nog varit lättare att förstå. Värdekedja, BMC det är de visuella bilderna jag minns från det här
 - Vad kände du när du gjorde detta?
 - Varför/varför inte
 - Ja men jag upplever att på slutet var det tydligare och snabbare, men kan ju vara att förstod att allt var uppställt. man måste ju alltid förstå vad modellen visar. Och dessa stegen var ju på samma sätt.
- Hur säker är du att du gjort rätt 1-5
 - varför/varför inte

P5:

- Nu är jag uppe på 4,6
- Jag tog mer tid på mig. var lite mer logiskt. Sen tog jag alternativ väg. Jag läste mer också, kanske var snabb på den andra

P4:

- Jag säger e 4a på den då. den kände jag mig mer trygg i.

P3:

- asså jag fyllde i rätt, eller rätt beslut?
- Jag ska väl säga att mest osäker på var att välja reparation att den kändes otydlig. Att kanske göra mer illustrativt, jag tror att många leverantörer har säkert en om man aktivt tar sig in i snårig djungel av cirkularitet så har man en grundinställning om hur man ska få det att fungera. Så det steget blir tydligare, att jag tror att det är denna vägen jag ska gå - hur det blir i praktiken, och av det innebär.
- Och nu en nytt flödesschema.

- Förstår du vad du har gjort?
 - Varför/varför inte

P5:

- Ja, men det tror jag
- Är lurigare när det är fiktivt. helt linjär till delvis cirkulär BM
- Det jag kanske inte kopplade, var ju procenten, men det är ju väldigt bra. SWOT, möjligheter och risker
- Jag förstår vad jag har gjort

- Vad tycker du om sammanfattningen du har framför dig nu?

P5:

[resultatet]

- Läser lite snabbt här
- Är den olika efter vad man har valt då [L: precis]
- Det här är ju mer tillägg än en helt ny affärsmodell
- Jag gillar den grafiska illustrationen, den var tydlig och man förstod att det hänt något i mitt sätt att tänka
- Kanske senare en KPI, lite frågetecken kvar sen kanske. koppla på den delen med. jag vill att 10% av alla produkter kommer tillbaks för att reparera etc. det kanske är utanför scopet?
- Om man väljer flera olika, detta vill jag kanske ska vara min. det här ska bli min huvudsakliga sen, bli bättre i designfasen för att det ska bli bättre och redan där i KPI. Saknar kanske lite helheten
- Det här en hjälp att tänka och det är bra, men sen kanske vill ha nästa steg
- Är detta alla eller de jag highlightar i den cirkulära [l:ja]. det låter logiskt.
- Koppla lagkrav och sånt med kanske, vidareutveckling
- Kunna fatta beslut, kunna få kartlagt i samma - med lagar och miljömärkning etc.
- Annars bra.

P4:

- Cirkulär värdekedja är ju ofta en cirkel - hade gärna, kanske inte funkar, men trevligt ur det perspektivet att den är cirkulär affärsmodell eller värdekedja. Men den jag tittar på nu visar ju väldigt bra då och kanske mer korrekt än en cirkulär modell hade gjort - visuell vackert också.

P3:

- Den här känns ju. Här har ni fångat upp. Det handlar ju mest om att vi har gjort en liten läxa i form av att skriva ner, så vi inte flyger runt i alla väderstreck. Den stora utmaningen är ju allt det praktiska och logistiska runt omkring, transporter är alltid utmaning. Men så länge man håller sig till sitt egan att det ofta inte ss komplicerat. större utmaning är ex återtillverka och skapa nytt av gammalt, då är det nog tuffare att ringa in i formatmall. men annars så absolut. Ni har väl kommit hur långt som helst.

- Förstår du den?

P4:

- Sammanfattningen... det var framförallt, i grund och botten förstår jag allting dät.
 - Stämmer den?
 - Litar du på den?

P4:

- Ja, men det tror jag.

P3:

- Det tror jag jag måste fördjupa och läsa nogare
- Om den syftar till att vara en dörröppnare för att börja jobba med det här, då är nivån att förstå innebörd för växlingen. vad betyder logistik. osv. tänk på tillgång på material osv

- Saknade du någon information i det du gjorde nu?
 - Varför/varför inte

P3:

- Generell feedback. mer beskrivande, tänka sig att den som tar till sig har kanske inte alltid gått ut gymnasiet, eller sätt flödesschema. koka ner till enkelhet och göra tydligt - vad är affärsnyttan, och innebörden gentemot jobba reparation vilken tjänst erbjuder jag, vad förväntar sig kunden, och praktiska apparat runt omkring. annars har ni fått med allt, sen bara förpackning. mindre text där det inte behövs och mer där man förväntas göra.

Follow up questions

- Vad tycker du om verktyget?
 - Varför/Varför inte

P4:

- Jag känner att jag behöver jobba mer med det för att, behöva använda för att ha en bättre uppfattning
- Jag gillade ju slutdelen, med det man fick presenterat

- Förstår du det?
 - Varför/Varför inte

P4:

[L: Vad saknar du?]

- när jag funderar på det, den visuella värdekedjan. om jag hade valt 5 st, hur hade den blivit då? då hade det kunnat få vara min cirkel
- i min verklighe använder man flera strategier

[L: Vad du får ut]

- Jag behöver mer tid för att smälta, jobba med ett exempel för att förstå den för att uttala mig om det
- Att göra BM i den här canvasen, är inte helt enkelt. kan man få det inplockat i denna modell är det väldigt tacksamt.

- Litar du på resultaten du fick av verktyget, om vi ponerar att det var du som hade skrivit in svaren?
 - Varför/Varför inte

P5:

- Ja men det tror jag.
- Kändes genomarbetat.
- Texten [sammanfattning av resultat] - kanske någon källa/källhänvisning om varför det är vårt det ekonomiskt, intressenter, och miljö. kanske räcker med fotnot.
- I modellen förklara strategier tydligare, var det kommer ifrån och innebär. kan vara svårt om man inte kan det kanske.

- Tycker du att det hade hjälpt dig att använda verktyget?
 - Varför/Varför inte

P5:

- Med de kommentarer jag gett, jag är kanske mer van och har tänkt i de banorna

- Men för de som inte gör det är det kanske mer relevant
- Men för SME tror jag det kan vara jättebra.

P4:

- Ja, men det tror jag.

[nästa nivå? ännu bättre]

- Synpunkt när man jobbar med dess BMC och det, är det bra att göra i grupp med post-it lappar och så dokumenterar man det i detta sen.
- Trevligare att göra det med verkliga, fysiskt med post-it på en vägg - det är mer kreativ, men man behöver dokumentera och då kan man göra det här

P3:

- Ja. Om man inte har varit inne i det förut kan det vara en hjälp att nästan lägga på dom förklaringsnivå att man förstår vad det innebär och vad jag har för möjlig tjänst Detta - väldigt schematisk och tydligt. Absolut.
- Enskilda affärer tror jag man får räkna på från gång till gång, som en vanlig affär.

- Hade du använt det?
 - Varför/Varför inte

P4:

- Uu säger jag bara snabbt. i min värld hade det varit bäst för att dokumentera, men sen har ni ju massa annat så som kostnader, risk osv och då är det jättebra. För den kreativa delen tycker jag det är bättre med post-it. Men där man registrerar är detta bra.
- Kontrollpunkter i det här flödet, grupparbete som workshops, efter det dokumenterar du det här i så delar grupparbete och delar mata in information.

P3:

- Ur eget perspektiv och vår verksamhet. nej, eftersom i dagsläget har etablerat och inte har avsikt att ändra arbetssätt som vi har. det är inte info som jag inte redan har
- Har jag inte gjort innan, då kan jag tänka mig att det hjälper att konkretisera avd det innebär

P5:

- Skicka gärna mail om det blir något.

[L: Kan skicka prototyp]

P4:

[L: Något mer du tänker?]

- Jag har nog tagit det jag har reagerat på. Men sen har jag inte helhetssyn.
- Jag tycker ändå, om ni kan få med workshop-grejerna med så för mig höjer det nivån. och för de som använder det blir det mycket roligare.

S

Result Expert Tests

This appendix includes the list of changes and appreciated aspects formed in the Expert phase. They emerged following the Expert tests. Notes marked with (-) are direct observations and quotes from the test sessions, and bullet points marked with () are derived from the AI-assisted thematic analysis conducted in Klang.ai. These are kept in their original Swedish to preserve authenticity. Section headings and category labels have been translated throughout.

Expert test 1

Changes:

- Scroll i dialogruta dåligt
 - Scrollning i popup är konstigt. Det här kan vara skärmen i sig. jag tror inte det behöver vara två cards. [Intäkter och kostnad]
- Varför ligger denna upp nu, och saker bakom [kort för kostnad vs intäkter]
- Jag vill veta vad nästa steg först - när ska fortsätta från sammanfattning efter ett steg
- Om jag ser reparera, och vill lägga in mer hur går jag tillbaks. Kan man edita inne i den - kunna gå tillbaka från sammanfattning för att ändra
- Om det är något jag skrivit för eget hand tycker jag det är rimligt att datorn inte ändrar. Men om det hade varit dropdown då hade jag velat att den ändrade om den vet vad som ska ändras
 - när ändrat från CBMC
 - Röda rutan ovanpå den vita rutan, får mig att känna att jag inte kan göra något i
 - Den hade kunnat vara ex i hörnet. markerat av datorn
 - Om jag ändrar i 3 sista stegen, och ändrar i sista. Varför behöver jag se att 2 inte ändras om jag ändrar i 1 och bara 3 påverkas. behöver jag ha en hel skärm för det.
- **Automatisering och dynamik:**
 - Utveckla funktioner för att automatisera ändringar baserat på tidigare val (t.ex. om en användare ändrar ett steg, uppdateras relaterade steg automatiskt). - *för svarsalternativ, men ej textrutor*
- **Flexibilitet och kontroll:**
 - *Gör det möjligt för användare att redigera tidigare val utan att behöva gå igenom hela processen på nytt.*
 - Undersök hur verktyget kan anpassas för att ge användare mer kontroll över vilka steg som visas eller döljs (t.ex. endast visa steg som behöver ändras).
- Vit frame, border och så blir mycket lager - det kanske inte behövs. jag vet inte, hade kanske kunnat flyttas - Risker
 - fine att scrolla hela istället för i kortet
- Shadow 0.0, se mer som cards typ.
- Gillar inte rött här. [är du säker], känns som jag gjort något fel
 - Det känns som det räcker med ja, och inte rött.
- Varför får jag inte ändra i efterhand? Är det inte min affärsmodell, vad händer om jag "Fastställ".
- Distanser är olika.
- Jag tror ni överanvänder strokes. Använd ganska selektivt. border sticker ut.
- Kanske om det finns underliggande vetskap kanske jag vill veta vad det är - det är baserat på olika [l det står i info].
- **Klickbara element och interaktioner:**
 - Gör klickbara element (t.ex. cirklar, knappar) mer tydliga och intuitiva för att undvika förvirring.
 - Förbättra feedback vid interaktioner, t.ex. genom att använda färg eller animationer för att visa när något är ifyllt, redigerat eller sparat.
- **Visuell design:**

- Förbättra färgkodning för att tydliggöra hierarki, tillhörighet och interaktioner (t.ex. undvik röd färg som felindikator om det skapar negativa associationer).
- Undersök hur skuggor, borders och avstånd kan användas för att skapa en tydligare visuell hierarki utan att överbelasta användaren.
- Begränsa mängden information som visas direkt för att undvika "information overload".
- **Feedback och säkerhetskänsla:**
 - Utveckla ett system för att ge användare direkt feedback när ändringar görs, inklusive vilka steg som påverkas.
 - Undersök hur verktyget kan ge användare en större säkerhetskänsla (t.ex. genom att bekräfta att de har gjort rätt eller visa en sammanfattning av deras val).

Information

- Left och Middle aligned gillar jag inte
Distanser mellan rubriker och hierarki.
- Hur info presenteras kan optimeras, högst nivå. Mycket info, presenteras alltid + underkategorier. Kunna se kräver och sedan gå in djupare.
 - **Struktur och översikt:** Undersök hur information kan struktureras bättre, t.ex. genom att använda högre och lägre nivåer eller expanderbara element.
- Men hur info presenteras - väldigt generellt att säga, men värt att tänka på
- **Hierarki och struktur:**
 - Omforma och förtydliga hierarkin i listor och punkter för att göra det lättare att lägga till och redigera information (t.ex. genom färgkodning, tydligare nivåer eller expanderbara element).
 - Undersök hur information kan segmenteras i mindre, mer hanterbara "cards" eller komponenter för att undvika överbelastning.
- **Terminologi och språk:**
 - Omformulera otydliga termer (t.ex. "vem inkluderar vi?") för att göra dem mer intuitiva och användarvänliga.
 - Använd konsekvent språk genom hela verktyget för att undvika förvirring.
- Rubriker i meningar är ledande, det är kanske det man vill ha, men många av dessa - inte lika lätt att scanna. Det är en avvägning, inte samma känsla som genomstegad - bl.a i Big summary
 - **Text och rubriker:**
 - Förkorta eller omformulera långa rubriker för att göra det lättare att scanna information snabbt.
 - **Metodbeskrivning: - gör tydligare att läsa om metoderna**
 - Klargör och kommunicera vilken metod eller vetenskapligt underlag verktyget bygger på.
 - Gör metodbeskrivningen tillgänglig för användare som vill förstå bakgrunden till de steg och processer som presenteras.
 - **Källor och referenser - Gör tydligare?:**
 - Inkludera källor och referenser för att stärka trovärdigheten och ge användare möjlighet att fördjupa sig i ämnet.

Overview

- Punktlista för mig, det här är kvaliteter till en sak. olika attribut. Punktlista förmedlar inte det för mig.
 - Men det är svårt att snabbt se.
- Jag hade velat ha som individuella grejer. Hierarkin blir konstig.
 - Frame;a om som inte frågor, tydligare vad som är under
- Oklart med fyrkant runt - stroke runt vad/vem/hur
 - Jag antar att de hör ihop
- Jag hade inte haft border att de hänger ihop [där nere] border visar att det ena är viktigare - vad/vem/hur

Carousel

- Känns som olika lager med dialogruta (inforuta) och cards under
- Osäker på hur man edit;ar
- Pilar är inom steget, föregående/nästa är inom - kanske är lite osäkert när båda finns
- Varför ligger denna upp nu, och saker bakom. - kostnader intäkter
- Scrollning i popup är konstigt. Det här kan vara skärmen i sig. Jag tror inte det behöver vara två cards. [Intäkter och kostnad]
- **Redigering och sparning:**
 - Förbättra edit-funktionaliteten för att göra den mer intuitiv och användarvänlig (t.ex. genom att tydligare visa vilka ändringar som har gjorts och hur de påverkar andra steg).
 - Implementera en tydligare spar-funktionalitet för att undvika förvirring kring om ändringar har sparats eller inte.

Edit value chain:

- Jag vet inte vilken vi kan edit;a
- Jag torr hjälp att veta vad, boxar var stadie, och cirklar process. Hade hjälp att se det nu med
- Jag vill ha en flagga, om att logistik kan inte komma mellan montering och produkt ex
- Nu är det edit på alla, det är för mycket. hover eller klick kan räcker, bort med skugg
- Jag gissar på nästa - när ska gå till sammanfattning, kanske borde stå sammanfattning ist?
- **Visualisering av värdekedjan:**
 - Förbättra visualiseringen av värdekedjan för att tydliggöra ordning och samband mellan olika steg (t.ex. montering vs. logistik).
 - Undersök hur produktstadier och processmoment kan skiljas åt visuellt för att undvika förvirring.
- **Dialogrutor och popup-fönster:**
 - Undersök alternativa sätt att presentera information (t.ex. inline-redigering eller modala fönster som inte stör flödet).
- **Redigering och sparning:**
 - Förbättra edit-funktionaliteten för att göra den mer intuitiv och användarvänlig (t.ex. genom att tydligare visa vilka ändringar som har gjorts och hur de påverkar andra steg).
 - Implementera en tydligare spar-funktionalitet för att undvika förvirring kring om ändringar har sparats eller inte.
- **Automatisering och dynamik**

Navigating/Progress bar:

- Grön känns "klar", ska den ha mer edit vibes - på stroke i progress bar
- Jag är inte såld på progress bar. mycket linjär som är najs, men mycket linjärt på många ställen. kanske mer hierarkiskt. färgkodning, geometri för att fatta vilken nivå, hade gett mer flow och fatta att jag gå mer djupare. standar out lite.
 - **Visuell feedback:** Använd färg, highlight eller andra visuella medel för att tydligt markera ändringar och visa tillhörighet mellan element.
- Hade hjälp med tydlig hieraktike (i progress bar)
- Ni har ju haft innan. är den bruna i samma, det känns som det är annorlunda från innan. kanske är bättre att card är bredvid mer.
- Dashboard för varje boll. vill kunna trycka på bollen. tydligare att sammanfattning är för hela bollen. att den är kopplad till bollen eller liknande. jag hade inte fattat att den var brun där uppe - så tydligare koppling.
- Mycker real estate här [uppe] så använd det - på ytan där progress baren är
- Nästa och föregående, pekar på de boxarna och de här - de är olika hierarki
 - Kanske F/N kanske flyttas upp så de kopplas tydligare [till progress bar]
- Om listan tillhör bruna, för sidan är den bruna rutan [i progress bar]. kanske hade velat kunnat se de fyra rutorna här nere. jag vill att brunt är kopplat till det som är där nere. färgkodning är viktigt att det hänger ihop.
 - **Visuell feedback:** Använd färg, highlight eller andra visuella medel för att tydligt markera ändringar och visa tillhörighet mellan element.
- **Navigering:**
 - Förtydliga skillnaden mellan olika navigationsalternativ (t.ex. "fortsätt" vs. "till steg", pilar vs. knappar) för att minska förvirring.
 - Utveckla en tydligare överblick över hela affärsmodellen, så att användare kan se och navigera mellan olika steg utan att tappa sammanhanget.
- **Linjäritet och processflöde:**
 - Utvärdera om processen kan göras mer linjär och lättare att följa, eller om alternativa flöden (t.ex. icke-linjära) fungerar bättre för användarna.

Strategy:

- Här blir den vit, jag trodde den var en dialog först. borde ha samma färg så de hänger ihop mer - när expanderar info
 - **Visuell feedback:** Använd färg, highlight eller andra visuella medel för att tydligt markera ändringar och visa tillhörighet mellan element.
- Mer knappig kanske - att man kan expandera
 - Mer knapp väldigt på extenda
- Min första tanke är att highlighta båda och ha en knapp. man fyller i två och sedan jämför - ha en knapp för att jämföra dem man valt
- Och sen nästa för lock;a in - tydligare fastställa att man valt den?
- Vill sortera på match - matchar vår prioritering från usability testen
- Hög abstraktionsnivå av hur många fyller ni i redan, nu måste jag kolla att den kräver 4 och den med, men jag vet inte hur de viktas - olika mycket jobb - även i sammanfattning
 - **Visuell feedback:** Undersök hur verktyget kan visa endast de krav eller steg som inte är uppfyllda, för att minska komplexiteten.

- **Struktur och översikt:** Undersök hur information kan struktureras bättre, t.ex. genom att använda högre och lägre nivåer eller expanderbara element.
- Info i sig check. En grön, en grå. Då behöver man inte ha tillgång till alla. Om du redan har gjort kräver det inte det.
 - **Visuell feedback:** Undersök hur verktyget kan visa endast de krav eller steg som inte är uppfyllda, för att minska komplexiteten.

Good:

- Dialogruta okej första gången - öppnas ej om man går tillbaka till samma steg igen
- Vem är kunden, jag hade valt företag och hade skrivit en fritext-kommentar - vad/vem/hur
- Kanske att man vill ha en confirm - vad/vem/hur
 - Det står ju under att det sparas
- Översikt där uppe [trycker]
- Om jag hade kunskap för företaget då hade jag kunnat bekräfta med det som står på skärmen - om sammanfattning
- Ganska som förväntat håller med om jämför kontra välj, ska klicka på dem två, så kanske inte hade make;at sense. Vilken ska man välja.
- Sammanfattning, är några checked. aha det var highlight på dem, bra
- jag tycker jämför är tydligt. ja men det är najs att kunna jämföra, så kan redan se vilka som jag fyller i och vilka som krävt mer.
- Tillgänglig info är bra, saknar ingen info
- Jämför hade bra responsiveness, highlight;as osv
- Najs att kunna trycka och öppna upp. - i CBMC
- Det stod att steg efter kan ändras, så då hade jag stegat vidare för att se om något ändrats - när man ändrar från CBMC
- Är detta en fritextruta, jag ändrar det nu, då är jag nöjd med det att det står där - röd ruta att detta bör ändras
- Förvarning bra. Vad som behöver och inte behöver ändras. Jag tycker jag var schysst.
- Listor som innan är najs - listor följer samma modell
- CBMC najs
- Jag uppskattar att man får %, känns som varje steg matas in i varandra. och man vet om att, det kanske funkar för oss. jag gillar sammanfattning, kanske ha en export - få en najs pdf - Big summary
- Jag ser visionen. hålla i handen
- Helhet make;ar sense efter några steg
- **All info jag vill ha finns tillgänglig.**
- Bra frågor varför värt osv
- **Bygger på håller i handen, men att det är en trovärdig person som håller i handen**
- Jag gillar risker.

Bad design but is needed for target group:

- Overload;as med information - i inforutor
 - **Struktur och översikt:** Undersök hur information kan struktureras bättre, t.ex. genom att använda högre och lägre nivåer eller expanderbara element.
- Men gillar inte scrolla i kort. gör bara hela större istället.

- Info overload från början. behöver jag få tillgång till all info från början? jag ser ändå inte allt, vad är det viktigaste och så kan man kolla mer om man vill. hur mycket info direkt och sedan när man vill se mer
- **Dialogrutor och popup-fönster:**
 - Omforma eller ta bort överflödiga dialogrutor som överlappar andra element och skapar förvirring.

Expert test 2

Viktiga insikter

- Tydlighet och hierarki i navigation är avgörande för att undvika förvirring hos förstagångsanvändare.
- Symboler och statusindikatorer måste förklaras tydligt för att användare ska förstå deras betydelse.
- För mycket text kan överväldiga användare; viktig information bör lyftas fram och förklaras koncist.
- Återanvändning av visualiseringar skapar kontinuitet och hjälper användare att känna igen sig i verktyget.
- Användare föredrar att testa sig fram snarare än att läsa långa instruktioner, vilket bör beaktas i designen.

Changes:

- Jag är lite förvirrad över fortsätt-knapp - hemsida
 - Jag antar att den kommer dit
 - Spaning: fortsätt och till steg gör samma sak
 - **Feedbackmekanismer:** Implementera tydligare återkoppling för användarens handlingar.
- Jag trodde (i) var en knapp [i inforuta], men vara bara en bild
 - Öka **interaktiviteten** (t.ex. genom att låta användaren klicka på information för att få mer detaljer).
 - Förtydliga **informations-knappar** så att användaren förstår vad som är klickbart.
- Kan jag byta till dark mode? [lampknapp]
- Översikt spontan känsla - när vill gå till alla svar/sammanfattning
- Mest förvirrande att det fanns flera olika sätt. det kanske är bra om man är mer expertis i systemet, men kanske svårare för en förstagångsanvändare
 - **Användarvänlighet:** Förenkla interaktionen med verktyget för förstagångsanvändare.
 - Minska antalet **alternativa vägar** för att utföra en uppgift (t.ex. begränsa antalet sätt att navigera vidare).
- Alla huvudrubriker, mycket rubriker. vart jag var förvirrad lite
- Känns inte som något som finns här [scroll] - vet ej intuitivt vad som kommer finnas i info-ruta
- Behöver vara ha infoknappen här? jag blir galen på att visa funkar och inte - i värdekedja på big summary
 - Öka **interaktiviteten** (t.ex. genom att låta användaren klicka på information för att få mer detaljer).
 - Informations-knappar och ikoner var inte alltid klickbara, vilket ledde till frustration.
- Vet inte varför jag vill ha pilar överallt - detta leder hit
 - Lägga till **pilar eller visuella indikatorer** för att visa samband mellan steg i processen.
- Huvudslutsatsen är att verktyget har potential men kräver förbättringar i tydlighet, hierarki och förklaringar för att underlätta för förstagångsanvändare.

- Hierarkin mellan rubriker och undermenyer var otydlig, vilket gjorde det svårt att förstå var i processen man befann sig.
- Deltagaren föreslog att symboler och deras betydelse borde förklaras tydligare i verktyget.
- Deltagaren efterfrågade tydligare kopplingar mellan olika delar av affärsmodellen för att förstå hur de påverkade varandra.

Navigating/Progress bar

- Jag fattade inte vad detta 3, och de tomma [progress bar]
- **Hierarki och navigering:** Förbättra strukturen för att göra det tydligare var användaren befinner sig i processen.
 - Inför en **hierarkisk skillnad** mellan övergripande och underordnade uppgifter (t.ex. genom typografi eller färgkodning) för att undvika förvirring.
 - Gör **rubriker mer beskrivande** (t.ex. byt "Översikt" till "Nuvarande affärsmodell" för att tydliggöra var användaren befinner sig).
- **Visuell tydlighet:** Skapa en mer intuitiv design som guidar användaren genom verktyget.
 - Lägg till **pilar eller visuella indikatorer** för att visa samband mellan steg i processen.
 - Skapa en **strömlinjeformad röd tråd** genom verktyget för att guida användaren.
 - Återanvänd **visualiseringar** för att göra det tydligare var användaren befinner sig i processen.
- Minska antalet **alternativa vägar** för att utföra en uppgift (t.ex. begränsa antalet sätt att navigera vidare).
- Deltagaren upplevde förvirring vid första användningen på grund av för mycket text och otydliga navigationsalternativ.
- Flera sätt att utföra samma uppgift skapade osäkerhet (t.ex. 'fortsätt'-knapp vs. stegvis navigation).
- Statusindikatorer för steg i processen (bruna/gröna) saknade förklaring och skapade förvirring.

Information pane:

- Finns det anledning till det är uppdelat i två? [inforuta]
 - Hade man kunnat göra tydligare
 - Det var mycket text. och avd är viktigast för mig att läsa här
 - Exempel extremt intressant för mig. Vad andra företag gör som exempel.
 - **Exempel och inspiration:** Använd konkreta exempel för att motivera användaren.
 - Inkludera **exempel från andra företag** för att inspirera användaren (t.ex. hur andra möbelföretag har använt verktyget).
 - Färgkoda beskrivningar, exempel eller varför - för att veta vad som är viktigt så det inte bara är text
 - **Färgkoda eller gruppera** information för att skilja på beskrivningar, exempel och instruktioner.
- Det känns som att detta hade räckt med info. kanske bara är lat och inte orkar. jag vill testa mig fram, bra att det finns men orkar inte läsa.

- **Komprimera text** och prioritera det viktigaste (t.ex. flytta exempel högre upp på sidan).
- Deltagaren upplevde förvirring vid första användningen på grund av för mycket text och otydliga navigationsalternativ.
- Deltagaren fann det lätt att navigera till strategivalet men upplevde att det var för mycket text att läsa.
- Erbjud **alternativa sätt att ta till sig information** (t.ex. genom att låta användaren välja mellan att läsa eller "testa sig fram").

Overview

- Först när jag kom in var det nog mycket som hände på skärmen på Ö-skärmen
- Nulägesanalys stod aldrig någonstans här [översikt]
 - Hjälpsamt ist för Översikt, Nuvarande affärsmodell.
 - Så man inte tror man har fastnat
 - Och att allt är lika stort. vad som är före vad
 - Insitktivt här, jag förväntade mig att det skulle stå vad där det står nuläges
- Måste de hänga ihop? [Vad etc] ja okej. så dessa 3 första påverkar inte nuvarande värdekedja. Jag gör dem. Kan man förtydliga det? som en pil eller så. För jag fattade inte att den var direkt kopplad. jag orkade inte läsa texten. Något mer signalerar att detta är viktigt
- De sista var mer straight forward för det bara var steg steg steg
- Gör det enklare att **identifiera och komma ihåg tidigare svar** (t.ex. genom att visualisera dem tydligare i översikten).

Carousel

- Vi är inne i en sida i en sida i en annan sida - vad
- Jaha så det finns flera Vad
- Två sätt för info. jag fattar att det är för olika. men kanske skillnad på var man, hierarkisk skillnad. Lika stora och färg så samma vikt.
 - Gör **rubriker mer beskrivande** (t.ex. byt "Översikt" till "Nuvarande affärsmodell" för att tydliggöra var användaren befinner sig).
- Kanske svårt att avgöra vad som tillhörde vad, eftersom det var 10 olika. och alla 10 ser exakt likadana ut så om man behöver komma ihåg vad jag svarade här, kunde jag se på Ö, men om gjort 10 är det svårt att veta avd man svarat innan. För att allt såg likadant ut.

Change in value chain

- En skillnad på de runda och rektangulära, men jag förstår inte vad. [läser]
- Jag tänker automatiskt, att den jag vill ändra borde ta mer plats. för jag blir förvirrad av vad den var [där nere]
 - **Visualisering av data:** Förbättra hur affärsmodellen och värdekedjan presenteras.
 - den original hade kunnat vara mycket mindre
- Sen fattade jag inte dessa [undo buttons]
- Vad är info här - jaha detta är inte heller en knapp [i ändra popup i vk]
 - Så info-knappar som både är klicka, och för att visa att rutan är information?
 - Det förvirrade mig lite
- Symboler (runda vs. rektangulära former) var otydliga.

Strategies

- Om jämföra, så vill jag se samma info på två som när man signar upp - man ser 3, 4, 5 stycken
 - För här var alla olika krav
 - Kanske folk i branschen fattar
 - Men najs, vad får jag här som jag inte får från andra?
- Hur matchningen vet jag inte hur den räknas ut %. det fattade jag inte
- Denna match baseras på tidigare svar?
 - Hade kanske varit najs att veta. men det kanske står i inforutan. det känns som viktigt att förstå. kanske highlightat?
 - **Highlighta viktig information** (t.ex. matchningslogik eller procentuella skillnader mellan strategier).
- **Informationshantering:** Göra det enklare att förstå och jämföra data.
- Inför en **jämförelsefunktion** som visar strategier *side-by-side* (t.ex. som en prislista med olika funktioner). - *vilka som är samma krav, som ex If*
- Matchningsprocenten för strategier var otydlig och saknade förklaring, vilket gjorde det svårt att förstå dess relevans.
- Jämförelsefunktionen mellan strategier kunde förbättras genom att tydligare visa skillnader och fördelar.
- Deltagaren föreslog att viktig information (t.ex. matchningsprocent) borde lyftas fram mer tydligt.

BMC

- Jag fattade inte att helheten var BMC, men det kanske de förstår? - i översikt gällande namn
- Men det fyllde jag väl i i steg 1?
 - Jaha det vara bara nutidsanalys?
 - **Jag läste inte ord?**
- Slutsteget med att 'spika' affärsmodellen upplevdes som tydligt och viktigt, men kunde förtydligas ytterligare.

Big summary

- Jag saknar strömlinjeformad röd tråd. Nu har jag gjort detta, nu går jag hit. highlighta det viktigaste. poppa fram mer viktiga grejer
- [kunna öppna CBMC i Big summary] Jag vet inte varför den är här, vill man inte bara ha resultat?
 - Sen är de kul att klicka på interaktivitet och så.
- Deltagaren efterfrågade en tydligare röd tråd genom verktyget för att förstå kopplingar mellan olika steg.

Good:

- Jag tror jag tryckt p hur fungerar verktyget, för jag vill veta vad som händer [klickar & läser]
- Och jag vill lägga till i nuvarande - tryck till steg.
- ***Då ser jag en stor orange knapp för gör ändringar, det känns väldigt tryggt*** - ändra i VK
 - Första sidan tydlig för man ser vad det är, och stor knapp. Jättetydligt
- Här var det ganska tydligt iofs [hemsida]
- Uppgift i sig, kändes intuitiv att lägga till och ta bort - vad/vem/hur
- Det här var tydligt med [progress bar där nere] - vad/vem/hur
- Eh det var tydligt att jag la till dem sakerna jag la till - när kollar sammanfattning
- Någon info om att dina svar sparas, så tydligt
- Juste, här är samma gruppering. så de har med saker och göra - i översikt 1&2
- Jag börjar bli mer familjär - i steg 2
- Det står att jag valt reparera så stor 5a - i sammanfattning 2
- ***Här känns spontant mer najs [info], för den har mindre info***. Här hade jag läst allt. det gillar jag. [37:30] - när översikt hade mindre info i inforuta
- ***Aj aj aj. Tydligt röd varning. Är bra om det är ett viktigt steg***
- Jag tyckte det var tydligt sista steg
- ***Men väldigt tydligt att jag låste in. Skönt.*** - i CBMC
- Bra att återanvända visualisering och inte sätta in nya. då fattar jag. och sen kommer lite ny data antar jag. - i Big summary
- Mycket text. mycket text behövs. här är det fine med mycket text, all info man vill ha - big summary
- Annars känns detta väldigt tydligt - Big summary
- Ändringar i värdekedjan upplevdes som intuitiva
- Deltagaren fann det lätt att navigera till strategi-valet
- Deltagaren uppskattade att verktyget återanvände visualiseringar för att skapa kontinuitet och igenkänning.
- Slutsteget med att 'spika' affärsmodellen upplevdes som tydligt och viktigt, men kunde förtydligas ytterligare.
- Sammanställningen av affärsmodellen innehöll mycket text, vilket motiverades av att det var en sammanfattning av alla resultat.

T

Fulfilled requirements and guidelines

This appendix presents the requirements and guidelines which are fulfilled through the final prototype. This is based on the informed requirements and guidelines in Appendix K. They consist of their numerical ID as well as their description. See the appendix for the full view of each requirement or guideline.

ID	Description	ID	Description
1	Be a digital tool	4,1	Motivate why circularity is necessary
1,2	High usability	4,2	Motivate the use of this tool
2	Base development process on four steps framework	5	Enable understanding of the practical work of the new
2,1	Initiate the development process with analysis of cu	5,3	Include support for remanufacturing workflows
2,11	Enable analysis of current business model's actions	9,21	Differentiate clearly which BM is changeable and not
2,111	Enable analysis of current business model's actions	9,22	Enable complex visualisation of BM in several layers
2,112	Enable analysis of current business model's actions	10	Adaptable to DPP's system
2,113	Enable analysis of current business model's actions	11	Connect how the company's possibilities can increase
2,12	Enable analysis of current business model's action	12,1	Enable comparison between business models before a
2,121	Enable analysis of current business model's action	12,11	Highlight the changes from the transition
2,122	Enable analysis of current business model's action	12,12	Highlight the changes where focus is needed
2,123	Enable analysis of current business model's action	12,13	Include alerts and guidance for high-priority actions for
2,124	Enable analysis of current business model's action	13	Work as unified platform for the businesses stakeholder
2,13	Enable analysis of current business model's action	13,1	Enable collaborative modeling in the development of th
2,131	Enable analysis of current business model's action	13,2	Enable commenting and annotation
2,132	Enable analysis of current business model's action	13,3	Include a collaboration & communication module
2,133	Enable analysis of current business model's action	15,1	Comparison of different external methods
2,134	Enable analysis of current business model's action	16	Support internal and external community/network
2,2	Facilitate identifying of future circular strategy as a	16,1	Enable external collaboration between companies
2,21	Enable identifying of the company's available resou	16,2	Encourage knowledge-sharing spaces
2,211	Enable identifying the company's available resource	16,3	Include support to internally communicate change
2,212	Enable identifying of the company's available resou	18	Make process of CBM development easily followed
2,22	Enable identifying of the company's customers and	18,3	Offer clarity in the understanding of the tasks within the
2,221	Enable identifying of the company's customers thro	18,4	Enable foundational understanding of the process
2,222	Enable identifying of the company's partners throug	21	Support SMEs
2,223	Enable identifying of the company's customers and	22,2	Support low digital maturity
2,23	Enable identifying the company's circular goals	22,21	Include low digital complexity
2,24	Present alternatives of circular strategies	22,22	Offer clarity in interface
2,241	Visualise circular strategies (10R/3R framework)	22,224	Offer clear correlation between functions' design and th
2,3	Facilitate choice of circular business model as a thi	22,2241	Offer clear understanding of which are clickable eleme
2,31	Enable identifying different circular activities based	22,2242	Offer clear understanding of which are unclickable ele
2,32	Enable decision of distribution of activities to intern	22,225	Offer consistency within the interface
2,33	Present alternatives of handling return flows	22,226	Offer consistency within layouts
2,34	Present alternatives of circular business models ba	22,227	Offer consistency with automatic actions within the inte
2,4	Enable concretisation of the company's new circular	22,228	Offer consistency in descriptions
2,41	Enable concretisation of the company's customers	26	Bring an understanding why it's worth it for the busines
2,411	Enable concretisation of the company's customers	27,1	Encourage community learning spaces
2,42	Enable concretisation of the company's cost and re	31	Enable following the market's circularity
2,421	Enable concretisation of the company's cost throug	32,3	Help understand customer needs through customer co
2,422	Enable concretisation of the company's revenues b	33	Help increase knowledge of circularity within the comp
2,423	Enable concretisation of the company's revenues th	33,1	Increase knowledge about circular economy
2,46	Enable collective concretisation of their new busine	33,2	Increase knowledge about remanufacturing of furniture
2,461	Include Add / Remove / Change operations (mutatio	35	Offer something the company cannot do without it
3	Ensure feeling of trust	37,3	Include support for modular product assessment & dec
3,1	Show respect to the reality of the business	43	Enable multiple navigational paths through the tool
3,3	Ensure feeling of trust for the new business model	46,1	State clear differences between strategies
3,31	Increase trust in the information regarding different	46,2	Enable mapping of strategies for the company
3,4	Ensure feeling of trust in the tool	46,21	Enable inclusion of KPI in the mapping of strategies
3,41	Ensure trust for the chosen methods in the tool	46,22	Enable inclusion of SWOT-analysis in the mapping of s
3,42	Ensure feeling of being thoroughly revised	48,14	Enable copying blocks
		50,1	Enable prioritisation of the relevant strategies